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Your Spectrum, Sportscene Specialist Press; 14 Rathbone Place, London W1P 1DE.

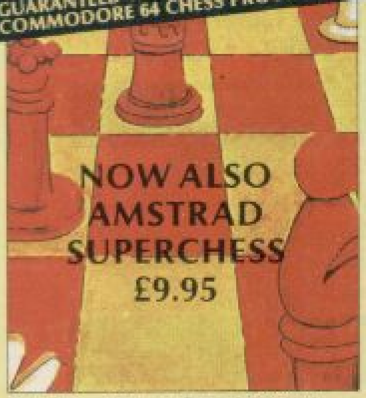
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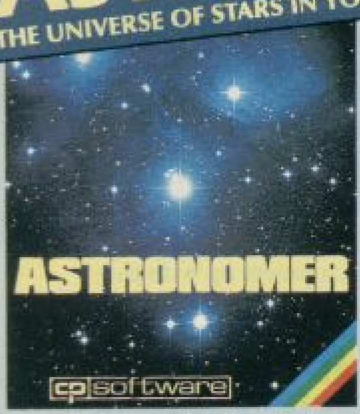
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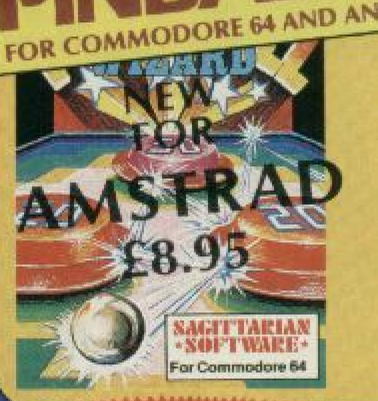
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YS 2

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Were you one of our Avalon compo winners? Do you fancy entering the Sunday Observer compo? Read all about it here first ... in Frontlines!

FRONTLINES

RUBBER KEYS — R.I.P.!

The ZX Spectrum is dead! Long live the Spectrum+! Yes, you heard right — the original Spectrum, 16K and 48K, is being phased out from Sinclair Research's product line ... rubber keys and all!

Of course, you'll still be able to buy the Spectrum — but its days are numbered. WH Smiths, one of the major retail outlets in the UK, is selling off its old Speccy stock at £99.95 for the 48K machine; the 16K model is going for £69.95 (*If you can find one, that is! Ed.*). And as this is probably the last chance you've got to buy yourself a piece of micro history, we'll forgive you if you don't want to read any more and shoot off down the shops.

Of course, there'll always be a Spectrum — it's no accident that the Spectrum+ is nothing more than a Spectrum in a new box. To reinforce its new position in life, the Spectrum+ is now carrying the reduced price-tag of £129.99! Sinclair Research is also offering current Speccy owners the chance to upgrade (?) to a Spectrum+ with a £20 'keyboard kit'; if you're feeling lazy, Sinclair Research will do the job for you ... but it'll set you back another tenner! Vile rumours that Sir Clive is selling off the extraneous rubber keyboards to be melted down and made into puppets for TV's *Spitting Image* are, of course, blatant lies ... especially since Sir Clive's last appearance on the show!

And so it really looks as though the micro-war's hotting up, especially when you note that Acorn Computers has reduced the price of the Electron in direct competition to the Spectrum+. Good mates, Sir Clive and Chris Curry (of Acorn) were seen recently attempting to battle the micro-war on a more personal basis — but we're happy to report that they've since made up.



Look closely at the home computer in this photo — you many never see its like again!

PROPER INCENTIVE



Incentive's *Moon Cresta* — pretty much like the original.

Incentive, a company which actually cares about its customers, has announced the winner of the Ket Trilogy competition.

Tom Frost, aged 47, from Montrose collected his £400 of video equipment from Ian Andrew (Incentive MD) and Richard McCormack (author of the adventures). This news arrived just as Incentive was about to launch its officially licenced version of the arcade game, *Moon Cresta*. The incentive to beat *Moon Cresta* comes in the form of Nichibutsu's original *Moon Cresta* machine. To get hold of this free standing wonder, all the player has to do is amass a score of 30,000 points.

Moon Cresta is now available for the Speccy at £6.95 from usual dealers. More details of this and Incentive's new game, *Confuzion*, on (0734) 591678.

CURRAH CRASH

To quote the press release, Dk'Tronics has a "delightful announcement for the industry". And that's that the recently-crashed Currah Micro Products has been swallowed up in the arms of the Dk empire.

The good news is that anyone holding a guarantee from Currah will find that Dk will honour the original agreement — so your Currah equipment is safe for a bit longer!

If you're a bit worried as to your warranty arrangement, give Dk a ring on (0799) 26350.

GETTING A ED!

As from the next issue of *Your Spectrum*, we welcome a new slave driv ... er, Editor on this illustrious mag.

Author of the sarcastic comments you've come to know and love (*What's all this? Ed.*) will now be one, Kevin Cox. As usual, any attempts to get hold of the *Your Spectrum* 'Hey, tell 'em I'm in a meeting' Editor can be made on 01-631 1433. Anything more technical than a friendly chit-chat should be directed to Troubleshootin' Pete who sits patiently awaiting your calls on 01-616 2416 (*YS* Helpline calls should be made on Wednesdays and Fridays only).



New YS Editor, Kevin Cox. (*April fool! Ed.*)



HE'S HERE! HE'S MADE IT!

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FRONTLINES

WIZARD WINNERS

Following the enormous response to our Avalon Competition (*YS* issue 11), we're now proud to announce the winners. There were, in fact, only 15 differences, although some of you thought there were up to 28 mistakes in our piccy — (*Perhaps you were counting mistakes throughout the whole mag. Ed.*).

The lucky winners of the compo, the one our Editor picked out of the golden dustbin-liner, was Colin Waters from Clacton-on-Sea, Essex. Well done Colin — the goodies are on their way!

And the 20 runners-up, in no particular order, were:

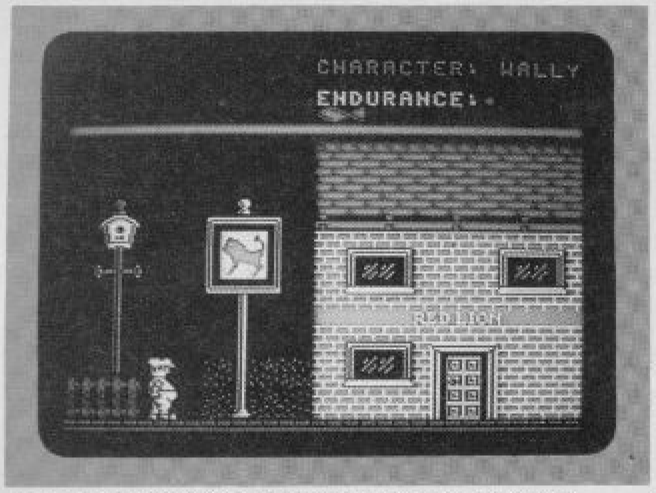
Aaron Marsh, Farreham; James Bolton, East Yorkshire; Mr HR Wharton, Luton; N Ashall, Manchester; Mr I Traverse, Merseyside; R Campbell, Aberdeen; Stuart Harding, Barry; I Smith, Hyde Park; Matthew, Cowbridge; Mr Sharp, Dundee; Elaine Lucia Corrie, Paisley; Philip Yale, Sunderland; Philip Squire, Walsall; Colin Howson, London; Mr D Adams, Ilkeston; Gordon



Ross, Dundee; Ian Roberts, Hatfield; Tim Ashton, Leicester; Gary Sadler, Worsley and Chris Butlin, Bedfordshire; Phew!

Well done everyone, you all get a copy of *ZAP*, Hewsons' latest machine code development system!

A BUNCH OF WALLIES



A drunken scene from Mikro-Gen's *Everyone's A Wally*.

Mikro-Gen yet again takes the software industry from the sublime to the ridiculous with its cartoon hero, Wally Week. Wally, would you believe, now has his own theme tune!

The ditty is entitled *Everyone's a Wally* and it's been written by John Watkins and performed by *Are you being served?* celebrity, Mike Berry.

And it doesn't stop there! Mikro-Gen tells us that it now has several major record companies interested in cutting a disc and one even wants to make a Wally Week video!

Mikro-Gen are on (0344) 427317.

COMPO OBSERVERS

This month we see the start of a national competition in the *Observer Colour Magazine* to weed out the best Spectrum buffs in the country.

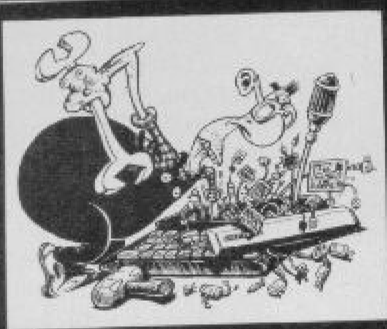
Co-sponsored by 'ever-lovable' Sinclair Research and top software house Quicksilva, the contest is designed to test computer skills as well as games-playing competence and strategy. The compo is based around Quicksilva's slightly geriatric *Xadom* maze game, and there's a trip to the Epcot Centre in Orlando's Disneyworld for the outright winner, plus runners-up prizes of QLs.

Our beloved Editor (*Just! Ed.*) Roger Munford is leading the panel of judges so you can naturally expect us to be following the competition very closely and, in the same vein, we naturally expect you to enter. After all, you *are* our dedicated readers, aren't you?

As all the questions in the first four stages of the competition are based around *Xadom*, it might be a wise idea to fork out the £4.95. And, as all the clues are being published in *The Observer Sunday Magazine*, that might be a wise investment as well!

Quicksilva can be found at PO Box 6, Wimborne, Dorset BA21 for those who want a copy of *Xadom* to practise on. For more details, watch this space next month.

·HARD FACTS·



If you're having hassles with your hardware, get in touch with DIY demon Stephen Adams, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

Well, if I can say it's nice to hear from you all, without sounding like I look forward to hearing about all your troubles, I will! Keep sending your letters in ... and I'll answer as many as I can through this column.

My first query came from **Mr Newby** of Kendal, who seems to be having problems with the SoftROM project in *YS*, issue 2. Having used 64K chips to allow it to be used as a memory add-on, he found that the finished article wouldn't work!

Well, my solution isn't perfect — in that it only gives 32K RAM without an external refresh chip — but here goes! Swop A7 and A14 connections and disconnect pins 13 and 14 from the edge connector, and connect them to zero volts. This will give you the SoftROM because A7 is always binary zero during refresh. I'm afraid, as suggested in a letter in *YS*, issue 4, this circuit can't be used to provide an extra 32K to a 16K machine — this would require 2552 (32K) chips, or 4164s with the decoding altered so that the CAS and ROMCS only operated when A15 is binary one. To get hold of the bits you'll need, contact Maplins Electronics, PO Box 3, Rayleigh, Essex SS6 8LR.

On a more enthusiastic note, **Jim Colburn** wrote in to ask where he could get supplies if he wanted to set himself up as a repairer of Spectrum gear. I'd say you couldn't go wrong enquiring at CPC, 194 North Road, Preston, Lancs PR1 1YP. After all, Sinclair Research use the company, so it should be good enough for you! Good luck, Jim.

Patrick Kerr had the misfortune to connect his Speccy to a faulty 32K RAM pack, only to find the -5V and +12V rails were disabled. Restoring transistors TR4 and TR5 restored the voltage rails, but caused the screen to flash and a continuous beep to sound.

The problem could be the transistors across the Z80A which decodes A0 for the ULA — and I'm afraid they might have blown. The other alternative is a little worse ... the RAM chips or the CPU itself could be damaged by the loss of power (while the +5V rail was still running) which would have put the address or data lines permanently at binary zero. I would suggest you take it along for a professional repair.

Our next worrier was **James Cridland** who's the proud owner of an issue one 16K Spectrum. He's having problems getting any speech synthesisers to work with his computer — so far, he's been through ones from Currah, Vox and Datel Electronics. Whew!

Methinks the fault lies with the SP80 decoder as it operates each time an I/O memory map access is made. Each time you use it, the top of memory (32K) which contains the machine code stack swop pages — this totally destroys the Basic ROM's idea of what it's doing. Removing the decoder should allow it to work. One thing, though, I thought the Currah speech device only worked with 48K models?

Well, that's it for another month. I'm here should any of you need any advice with any hardware problems, be they in the Spectrum itself or one of its many peripherals. Don't ring, I don't work in the offices, but write to me care of the *Your Spectrum* offices at 14 Rathbone Place, London W1P 1DE. And, please, don't send any damaged gear to me personally ... I can only give advice — I rarely carry a spanner around with me!

FRONTLINES

EDUCATING TEACHER!

The Hi-Technology and Computers In Education Exhibition, held recently at the Barbican Centre in London, attracted many teachers to its stands. As Mr Robert Dunn, MP responsible for the MEP (Microelectronicces Education Programme) pointed out, "the idea is to educate innocent teachers into the complex realities of what the micro market has to offer them".

To say the micro industry turned up in force would be an understatement. But then, considering that over £100 million has already been blown by various government schemes to introduce computing at all teaching levels (from Primary schools up to Universities and Polytechnics) it's hardly any wonder that the major manufacturers and suppliers are all hungry for a piece of the action!

The public response to the event was so great that at one point, even the seminars were turning people away! The stands weren't too crowded, but the 'No under-18s admitted' sign did seem a little incongruous ... until, of course, you noticed that there were so many adults indulging their childish whims, there wouldn't have been any room for the under-18s anyway!



MP Robert Dunn patronising (sic) the Hi-Tech exhibition.

GO-FASTER ADD-ON FOR C5



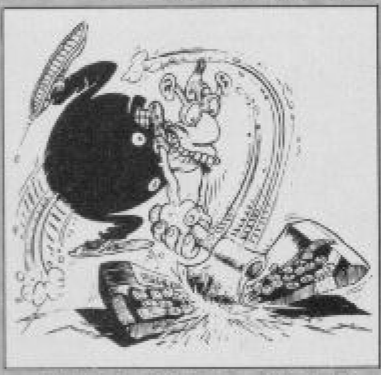
Look Mum, two wheels! *Which Bike?*'s Willis has a smashing time ...

Well, it had to happen! Someone had to take a POKE at Sir Clive's "new power in personal transport".

Exploiting the Sinclair Research accessory offer of an educational battery to double the effective range of the vehicle, certain sources are marketing thoroughly illegal wiring kits that promise to double effective speed. Trickery is apparently based on series battery connections.

As ol' Sir C's technical chappies have pointed out, the actual result is a burnt-out motor rather than a souped-up go-chart. So, here's a warning for all those parents out there thinking of purchasing one of Sinclair's 'less than finest' — if you see your young sprog zipping round the neighbourhood at frightening speeds, it's worth checking to see if the Hoovermatic's been looted for more traction!

HACKING AWAY



All the POKEs and more! Send your hacking hints to Andrew Pennell, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

Hello, and welcome once again to the back street hacking shop. Those with brains less withered than mine will recall the 'in depth' treatment given to *Scuba Dive* a few issues back (*My, how time flies! Ed.*). Well, **Andy Orchard** has written in with lots of tips on how to muck around with it.

First off, to get the POKEs in, you've got to load the program as usual, choose the LOAD option offered and, after confirming it by pressing the 'Y' key, press the Break key. You're now free to enter the POKEs and, to finish off the loading process, type 'GO TO 2' and press Enter.

The obvious POKE to start off with is for varying number of lives — POKE 55711,x (where 'x' is the number of lives up to 255). The only problem is cramming in too many divers into the boat on-screen.

If you're playing an opponent, POKE 45696,0 will ensure your opponent's clams take a considerable time to open — that should mean your opponent runs out of air pretty quickly and you end up winning (heh, heh!). Of course, be sure to have your turn before entering the POKE — you wouldn't want the plan to backfire, would you? Andy also found a bug in *Scuba Dive* that occasionally results in the diver being reprinted in the Status chart; as a consequence, our diver gets towed along like a water-skier when the boat moves off. Has anyone out there fixed it yet?

Moving on to one of my personal favourites, Quicksilva's *Fred*, **Paul Margetson** claims to have found the ideal solution for all cheats. It requires a little work to enter because of the loader program. Paul says that his girlfriend gave him 'invaluable help' in finding the information given here. But, without elaborating any further as this is an (*almost*) respectable magazine, let's get on with the hacking.

First off, type 'LOAD "" CODE 26384' and play the tape. That done, type 'SAVE "FRED" CODE 34500, 22650' and save it to an empty cassette. Now, to load your newly-created game, type 'LOAD "" CODE 24500'. It won't autoRUN anymore, so you can enter the POKEs given here as direct commands. Once you've modified it to your requirements, enter 'PRINT USR 30285' to start the ball rolling ...

Getting back to the POKEs, you can make your last unit of power everlasting with POKE 31175,0 — and if you want to vary the amount of power, POKE the number of units you require into addresses 30418, 31592 and 44696. Paul recommends a maximum of 240 units and, using these, he mentions that after level six you can choose the number of nasties in the mazes that follow. By the way, he recommends the *Mark 2* version of the Picturesque monitor (which he used for hacking away at Fred).

Entering the jungle world of *Sabre Wulf*, I remarked a couple of issues ago that I couldn't find the necessary POKE to keep Sabre Man permanently cyan. Well, **Nigel Salt** has come up with the goods (who's a clever boy then?) and they are: POKE 44685,186; POKE 44676,255; and POKE 44677,80. Many thanks Nigel!

Kokotoni Wulf has been hyped as being better than our ol' friend *JSW* though it's revealing that, up until now, it's never had a mention in this column — unlike its illustrious rival. To redress this imbalance, **Nicky Quinn** has gone to the trouble of dropping me a very useful letter ...

To begin with, you'll need to stop the program in the following way. Load the program as usual with 'LOAD ""', but as soon as the first section of code has entered and the PAPER colour turns green, stop the tape and don't rewind it. Next, reset the Spectrum and enter:

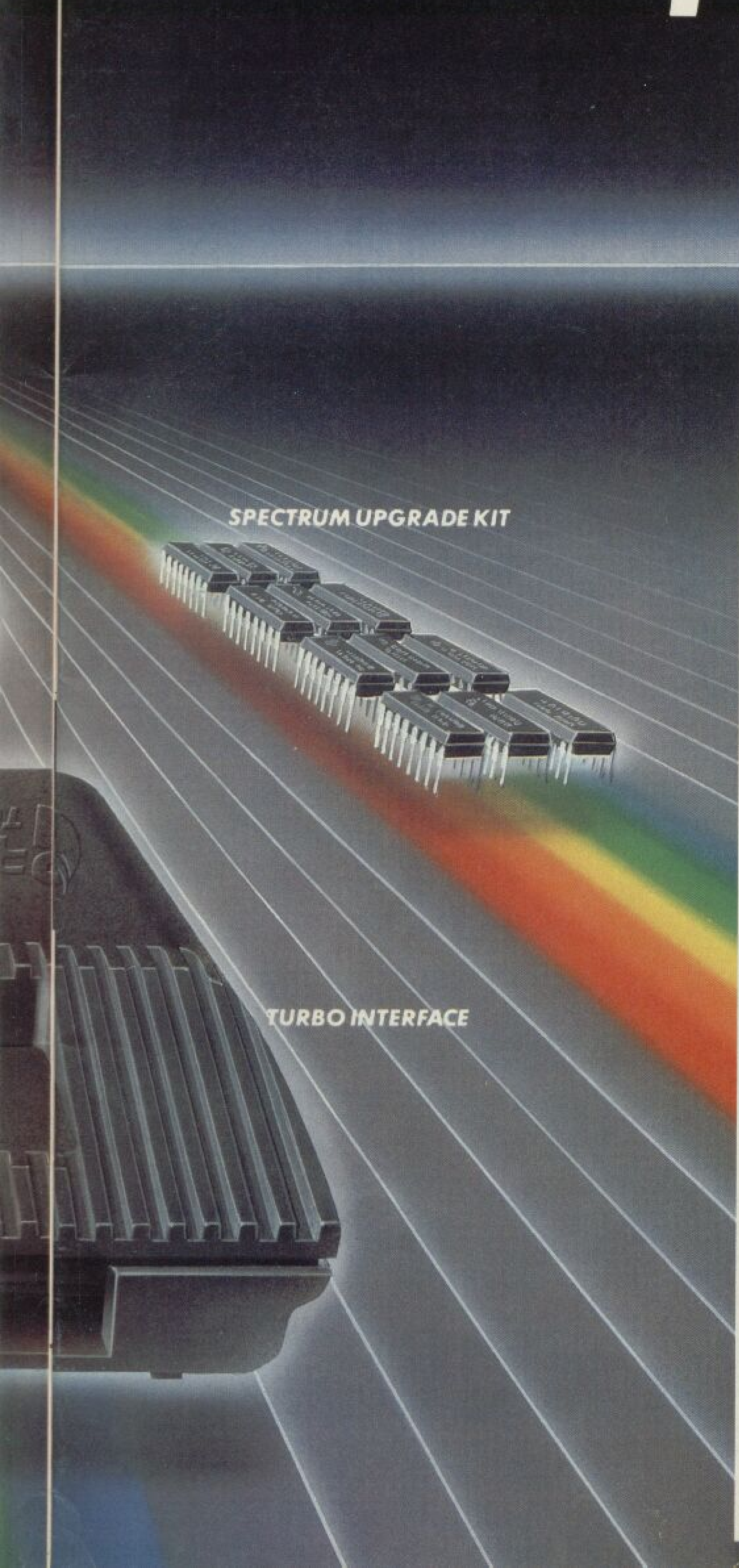
```
10 CLEAR 24100: LOAD "" CODE:
   RANDOMIZE USR 65100: LOAD
   "" CODE: POKE 43742,0: POKE
   42177,2: RANDOMIZE USR
   41200
```

RUN the program and then start the tape up again. The POKEs above can be altered to suit your taste. The first gives infinite lives, but you can change this to POKE 42214 to give you an option on the number of lives if you don't want to make it too easy. The other POKE simplifies matters by changing some of the sprites to red so that they don't kill you on contact. And to show that there's no bias on this page, I'm able to report that Nicky prefers to use the Dk'Tronics *Distron 48* monitor. So there!

Finally, **Richard Glass** came up with a good challenge for all you hackers ... how about a POKE or two for *The Hobbit* so that those who can't finish it (myself included) (*Me too! Ed.*) can take a look at the final screen.


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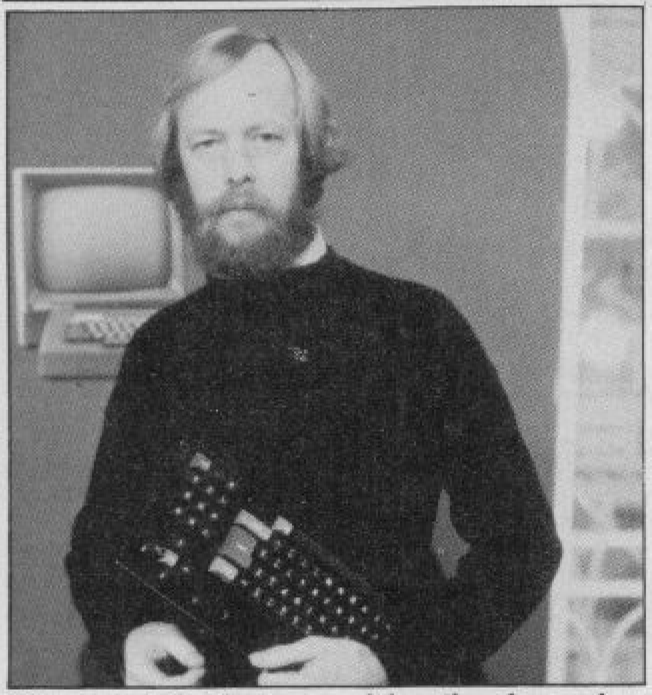
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GO FOURTH!



Microscope's Guy Kewney — pick up thy micro and talk!

Channel 4 has taken the plunge ... and come up with a computer chat show called *4 Computer Buffs.* Geddit?

Produced by the *Database* team, C4 calls it "a weekly news and current affairs programme for serious computer users". Back in the early days of computing, Edward Barnes, the then head of children's programmes at the BBC, said that computing shows were "looking through a glass darkly". It'll be interesting to see if C4 has managed to break the mould, and produce a show that's actually worth watching! But, of course, we'll all just have to wait and see ...

C4 also announced that it's launching an adaptor for the Spectrum (manufactured by OEL) allowing users to 'download' programs from it's own 4-Tel teletext service.

Channel 4 will be happy to tell you more about the adaptor and the new *4 Computer Buffs* show on 01-631 4444.

KEYBOARD KAPERS

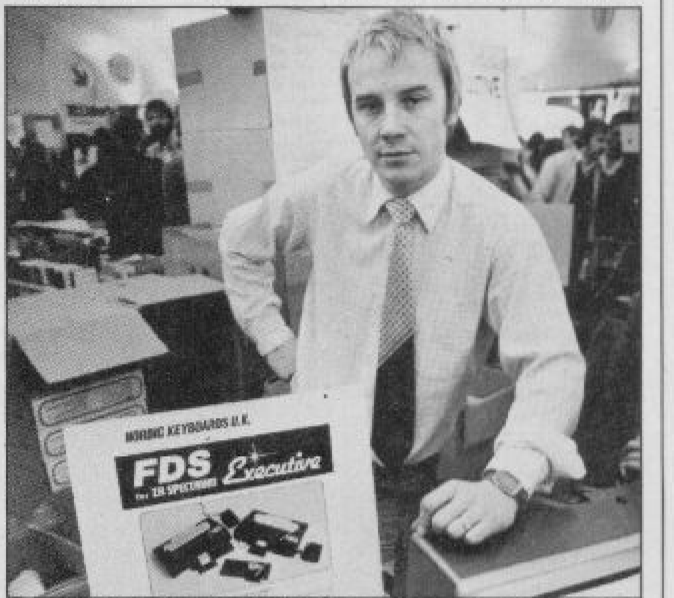
Nordic, the company that bought up all the Fuller stock in the liquidation flurry of last year, seems to have got itself in the same mess at its forerunner — perhaps the disease is catching!

Ex-Fuller man, Neil Roberts, told *YS* that Nordic has laid of all its staff and gone into voluntary liquidation. Here at the *YS* bunker we were hardly surprised to hear the news. Our very own Tony 'Slim' Samuels wrote a program for Fuller early last year, the idea being to fully demonstrate the versatility of the Fuller Master Unit. But, as Fuller never officially bought the rights to the program, Tony got decidedly twitchy when he saw Nordic using it at the first — and last — Microfair the company attended.

Apart from the threatened court injunction from our friend Tony, ex-fuller MD Roy Backhouse, also stepped forward to remove the copyright of the FDS keyboard from Nordic — which effectively meant that Nordic wasn't able to make any more of the units. No product equals no turnover and this left Nordic in the proverbial....

Further bad news comes from scouser Neil. The word is the so-called 'ultra-improved' version of the FDS keyboard is actually no different from the Fuller unit — apart from the logo sticker, and it still didn't work with *Tasword Two.*

The moral of this sad and tearful tale? Well, apart from the clear realisation that it's not a wise idea to mess with our large Mancuncian friend, if you're going to pay good money for the rights to a crashed company, then take a good look at what you're actually buying.



Nordic on a good day! (*It was a Tuesday, wasn't it? Ed.*)

FROM THE H/P



Troubleshootin' Pete Reporting...

Pete's phone lines are open from 10am-1pm and 2pm-5pm on Wednesdays and Fridays. Ring him on 01-636 2416.

Major problems this month with those moody Microdrives. Simon Goodwin, Mr *ZIP* himself, phoned and asked me if I knew why his 'drives should suddenly have begun whirring round in spontaneous fashion — taking no notice at all of lord and master!

Well, I too have had the odd 'runaway' — usually with important *YS* material on-board! — and I've traced the cause down to the simple fact that the TV (or another such interfering piece of equipment) is sat too close for comfort to the 'drive. By moving everything as far away as possible, you'll probably find that the erratic devices will work as they were originally intended. Obviously, if this fails to do the trick, then the next move is to go back to your dealer. Alternatively, it's been suggested that you jump into your C5, drive (very slowly) to Cambridge and attack the 'bearded one' personally with your duff gear... but I certainly couldn't condone such irresponsible action!

An interesting chap by the name of **Roger Freedman** called in this month with a query that will probably strike a chord with those of you who have been impressed by the hacking hints we give in the mag. Roger expressed himself quite taken by the whole business, and wanted to know how best to take the plunge himself.

Hacking is a developed technique, and although there are no short cuts as such, there's a formula which, if you follow it correctly, will put you on the right path. What hackers actually do is learn Z80 machine code as though it was their second language — they're then able to read through assembler listings (like the ones we print in *YS* machine code features) and understand them as well as the written text of a book!

In simple terms, though, it's just a case of locating the sections of the code that reduce lives (or whatever) and cancelling/changing/adding the necessary POKES. A good book to start you off on machine code is either our own Toni Baker's *Mastering Machine Code On Your ZX Spectrum* (published by Interface Publications), or Ian Logan's *Understanding Your Spectrum* (published by Melbourne House); the latter, by the way, as the title might suggest, is an essential user-guide for readers of this illustrious rag. Actually they're both very good books, written by two of the top Spectrum gurus in this country.

Finally, may I repeat the plea that I am *not* in the least 'hacking literate'. Phoning me with problems of that ilk is just a waste of your hard-earned cash. All you cheats would be far better advised to drop a line to *Andy Pennell* (who pens our *Hacking Away* column) and tell him personally of your deviousness and deceit!

FRONTLINES

RIPPER FLIPPER

Dolphin Adventure Holidays is yet again offering its world of excitement to the under-18s this Summer.

If you're planning your Summer holiday this year and you'd like a mix of outdoor/indoor activity, interspersed with a smattering of Spectrum computing, that's what Dolphin has got in mind.

Throughout the country, in such exotic places as Beaconsfield, Cobham and Crowthorn, Dolphin's holiday camps offer a wide range of 'things to do'. On the computing side, you can learn 'basic' programming and what's called the 'advanced' course. There are also activities such as swimming, horse-riding, surfing and so on.

Prices for the week's stay at a Dolphin computer camp start at around £144 + VAT. For more details, and a chance to ogle the pictures in its glossy brochure, phone (0444) 458177.

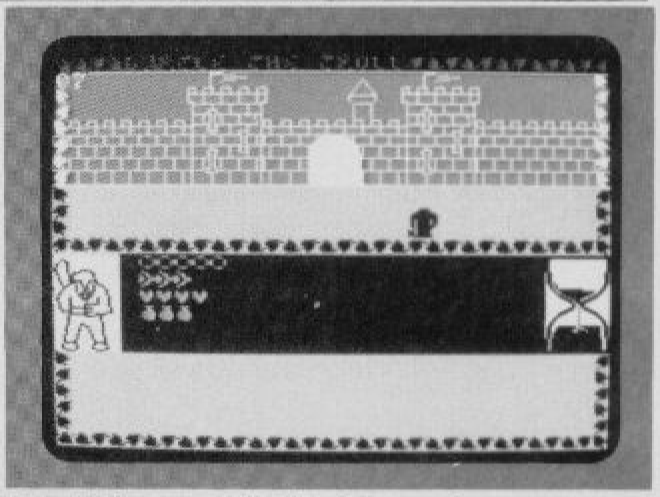


Matching jumpers at Dolphin. (*Yuch! Ed.*)

TAKES TWO TO TALISMAN

Claiming that it had 'the first ever interactive multi-player arcade adventure', Games Workshop launched the Spectrum version of its fantasy game, *Talisman.*

The program, which can involve up to four players in any one game, is said to be the true successor to *Valhalla. Talisman* is a race to reach the 'Crown of Command' and control the destiny of the world — of course! A horrific array of deadly creatures are out to stop you in your task, including those that are controlled by the computer and the other players.



GW's *Talisman* — *Valhalla's* follow-up?

As, at the time of writing, we at *YS* haven't actually seen the game, we can only ask you to believe what Games Workshop are letting on.

Try looking out for *Talisman* in the usual outlets at £7.95 — but if you have any problems, give Games Workshop a bell on 01-965 3713.

MORE FROM CHEETAH

At a time when several home computer manufacturing companies seem to be encountering all sorts of financial problems, Cheetah Marketing has released details of a product that it's going to be launching over the coming months.

Boasting not only a new joystick interface, a 56-way extension cable for the Speccy's user port (for under £10) and a two-way aerial adaptor for computer/TV input (for under £2), the company's also screaming about an entire new range of games for the Spectrum and Spectrum+. (*The Spectrum+ too! Now there's a thing. Ed.*) And that's all Cheetah's giving away at the moment. But if it's more details you're after, ring Cheetah Marketing on 01-833 4909.

QL CONCURRENT AFFAIRS

***For all the news and views on the QL micro, dispel those rumours with* John Torofex!**

ART FOR ART'S SAKE?

Not content with *QL Easel,* companies like Talent, CP Software and Eidersoft are all releasing graphics packages; and, of course, all are claiming that their product is by far the best on the market!

The one from Talent will apparently be based around the Commie 64 package *Panorama,* one that's quite amazing considering the 64's awful pixel resolution. So what, one wonders, are we going to get on the QL front?

CP Software is still working on its advanced graphics package and wouldn't be persuaded to divulge details. But Eidersoft's package *QL Art* is already released and will set you back £14.95. I wouldn't want to sound mean, but I'm not too sure if it'll stand up to what the opposition has planned, but if you'd like to phone Eidersoft, the company is on 01-478 1291.

STOP THE SQUEEZE

Isleworth-based Digitex Computer has launched another of those ever-useful utilities, this time one that allows you to make more use of your Microdrive cartridges.

The package is called STOP (STorage OPtimiser to you and I) and it squeezes programs down to roughly half their size when stored on 'drive. Not only does this mean all you micro misers can avoid shelling out hard cash quite so often, but it also opens up possibilities for large databases to be stored on a single cartridge.

Digitex is also promising the appearance of a Winchester version, something which should have you shuddering with anticipation at the storage possibilities.

For more details, write to Digitex at 4 Amwell House, The Woodlands, Isleworth, Middlesex.

QL'S BUSINESS CARD

QL+ Limited has produced a handy plug-in device which it describes as, "the first product to transform the QL into a true business computer" (*So what was it before? Ed.*). The card plugs into the QL's main expansion port, allowing it to run CP/M-80 software. It contains a Z80 chip and 64K of RAM and also offers two eight-bit ports with 64K of print buffer space.

Seeing that WH Smiths is apparently transfering the extensive CP/M-80 software library on to cartridge form for QL Microdrive use, at £199, this gadget might just make a worthwhile investment for that businessperson we keep hearing about.

THE QUEST BUSINESS

Quest Automatic has a new range of packages for converting the QL into a 'serious' business machine. The main item is a 68K version of CP/M and the 28.5K operating system is available on 5¼-inch floppy disk at £49.50. The equivalent Microdrive cartridge, complete with assembler, which co-resides with QDOS is £79.50. Quest also has a range of disk drives for the CP/M, from the 200K floppy at £249 to a selection of Winchester disks starting at £995.

It can also supply extra internal RAM from 68K to a cool half-megabyte and the whole caboodle can be stored in an expansion console for a mere £109. Two of the new business packages are also compatible with Psion's QL packages, so data is interchangeable — an advantage Quest cleverly intends to continue.

PLUGOLA!

YS's own Peter Shaw has been busy recently (*That makes a change! Ed.*) writing two books that'll be available by the time you're reading this. One is *Games For Your QL* (published by Virgin), which at £2.95 just about scrapes into the 'value for money' ratings. The other is *Games QL Computers Play* (published by Corgi/Addison Wesley). Anyone still wondering why the *YS* Editor bikes into work while child prodigy Peter Shaw drives a gold-plated C5?



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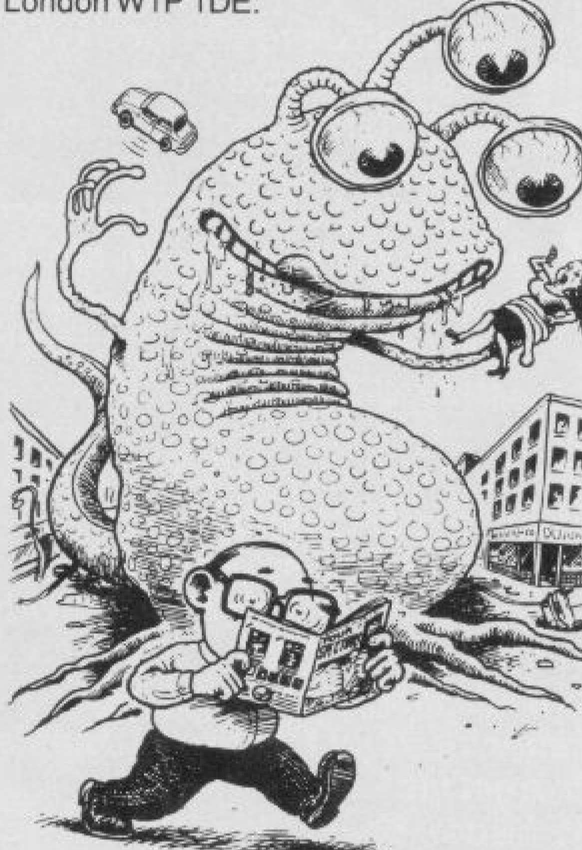
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TOP 20

• THE YS *READER POLL*

Welcome back to the chart you know isn't fixed! Thanks again for all the voting slips you've returned to the *YS* Towerblock. Keep 'em coming — how else are we going to keep bringing you the *original* reader-polled software chart that you, the loyal readers of *YS*, want to read?

Congrats go out this month to **James McMullen** of Eire — yes, James, your voting slip was the first chosen out of the Editor's hat this month and the Top 20 software prize is on its way! Remember, if you're entering one of our competitions, ordering a back issue or just writing in to Forum, fill out the form below (or a photocopy of same) and bung it in the post to the *YS* Towerblock.

Looking at the charts this month, it looks as though you're still playing all the classics, with *JSW*, *Sabre Wulf*, *Manic Miner* and *Atic Atac* still hogging the Top Ten. C'mon you lot — don't you ever play any of the new games?

YOUR SPECTRUM

My top five raves on the Speccy are:

1 ....

2 ....

3 ....

4 ....

5 ....

My three top turkeys on the Speccy are:

1 ....

2 ....

3 ....

Name ....

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....

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I understand that when this chart was tested — eight out of ten owners said their Spectrums preferred it. (*What? Ed.*)

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YS TOP TWENTY CHART

THIS MONTH	LAST MONTH	MONTHS IN CHART		
1	1	10	**JET SET WILLY** SOFTWARE PROJECTS	OH NO! NOT THIS ONE AGAIN ... THERE'S JUST NO STOPPING HIM IS THERE!
2	2	3	**DALEY THOMPSON'S DECATHLON** OCEAN	WATCH DALEY SWEAT IT TO THE TOP ... FROM THE COMFORT OF YOUR ARMCHAIR!
3	4	7	**SABRE WULF** ULTIMATE	HOW LONG WILL IT BE BEFORE *UNDERWURLDE* MANAGES TO OVERTAKE THIS ONE? YOU'LL JUST HAVE TO WAIT AND SEE!
4	6	4	**TLL** VORTEX	FLYING TONIGHT! THRILLS AND SPILLS IN THE AIR, AS *TLL* WAITS FOR A TOP THREE POSITION.
5	5	2	**UNDERWURLDE** ULTIMATE	A DEVIL OF A GOOD GAME! BUT WHAT'S HAPPENED TO *KNIGHTLORE* ... DON'T YOU LIKE THAT ONE?
6	9	2	**PYJAMARAMA** MIKRO-GEN	THE COLOURFUL WORLD OF WALLY'S DREAMSCAPE IS OBVIOUSLY KEEPING YOU AWAKE!
7	7	10	**MANIC MINER** SOFTWARE PROJECTS	YOU'VE DUG UP A REAL CLASSIC HERE! OL' MINER WILLY'S STILL PROVING POPULAR.
8	12	4	**FOOTBALL MANAGER** ADDICTIVE GAMES	IF YOU'RE A FOOTBALL FANATIC, HOW HAVE YOU MANAGED WITHOUT THIS SO FAR?
9	13	10	**ATIC ATAC** ULTIMATE	A CLASSIC ULTIMATE GAME — BUT HOW LONG WILL IT BE ABLE TO OUTCLASS *KNIGHTLORE*?
10	3	9	**TRASHMAN** NEW GENERATION	OH ... MY OLD MAN'S A *TRASHMAN* ADDICT — BUT THEN WHO ISN'T?
11	20	10	**CHEQUERED FLAG** PSION	FOUR-STAR THRILLS! GET INTO GEAR AND BEAT THE WORLD'S BEST RACETRACKS.
12	15	2	**KNIGHTLORE** ULTIMATE	EXPLORE THE HAUNTED CASTLE ... AND TURN INTO A WEREWUUULLFF-AARGHH!
13	RE-ENTRY	1	**MONTY MOLE** GREMLIN GRAPHICS	GREMLINS! FIND THE HIDDEN GOLD IN THIS *MANIC MINER* MIMIC!
14	NEW	1	**GHOSTBUSTERS** ACTIVISION	GHOSTBUSTIN' ON THE SPECCY? IT'S ENOUGH TO MAKE YOU BUY A CBM 64 (*BLASPHEMY! ED.*).
15	RE-ENTRY	1	**MATCH POINT** PSION	PSION SERVES UP THIS OUT- OF-SEASON WIMBLEDON SIMULATION ... AND SCORES AN ACE!
16	19	7	**LORDS OF MIDNIGHT** BEYOND SOFTWARE	THIS ONE'S GOT MORE SCREENS THAN MATTHEW SMITH'S HAD HOT DINNERS!
17	RE-ENTRY	1	**LUNAR JETMAN** ULTIMATE	NICE TO SEE OUR JET-PACKED FRIEND AGAIN — IF ONLY BRIEFLY!
18	RE-ENTRY	1	**MUGSY** MELBOURNE HOUSE	GANGSTER THRILLS FROM THE MELBOURNE HOUSE MOB! SO WHAT'S HAPPENED TO *SHERLOCK*?
19	RE-ENTRY	1	**JET PAC** ULTIMATE	REMEMBER THIS OLDIE? WELL, YOU'D BETTER TAKE A GOOD LOOK — IT COULD WELL BE THE LAST TIME!
20	14	5	**THE HOBBIT** MELBOURNE HOUSE	HANGING ON IN THERE — IT LOOKS AS THOUGH *THE HOBBIT*'S DESTINED TO HOP IT!

JOHN HALLET

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CODEBUSTERS!

I've just this minute put down Terry Bulfib's Codebusting article (*YS*, issue 11) and I'd like to add my fivepennyworth!

He describes a protection system that only works if you avoid the use of GO SUB in your programs. Actually, GO SUB — and all the other control structures, such as WHILE-WEND and REPEAT-UNTIL — are simply fancy ways of dressing up the GO TO command. Therefore, any lazy programmer can jump about in a program without wreaking the kind of abuse possible with a naked GO TO statement.

It's quite easy to simulate GO SUB in the following manner:

```
10 PRINT 'Start of program"
20 LET return=30: GO TO 100
30 PRINT "Back from subroutine"
40 STOP
.
.
.
100 PRINT "Now in subroutine"
110 GO TO return
```

You can use the subroutine at line 100 from anywhere in the program, changing the value of 'return' as appropriate at each call to make the program jump back to the correct part. If you're nesting these GO SUBs, you'll have to use different variables — return1, return2, and so on — so that you don't RETURN to the wrong place or overwrite a nested return point.

Of course, it's easy to simulate all the other so-called 'structured' commands mentioned above. All you need is a condition in the right place and a bit of self-control.

Peter Green, Chingford, London

Hmm, that name rings a bell... Anyway, Pete, thanks for that — and a plea for any other hints and tips any of you lot out there might want to give us regarding Terry's article. Ed.

SPECTRUM+ SNAG!

I'd just like to warn all readers who've just purchased a glorious Spectrum+ that it's no use looking to get hold of the Kempston joystick interface. It just won't fit! You'd be much better advised to check out the Pro joystick interface — the three port holes lay flat ... and the device fits just fine.

Stuart Free, Canford Heath, Dorset

Absolutely right, Stuart! OK, Kempston, what are you going to do now the original Spectrum design's been shelved by Sinclair Research? We await your latest interface with bland enthusiasm... Troubleshootin' Pete.

FORUM

Is there something you're not telling us? Don't miss out on the chance to win a bundle of free Spectrum software for each month's Star Letter! Write to Forum, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

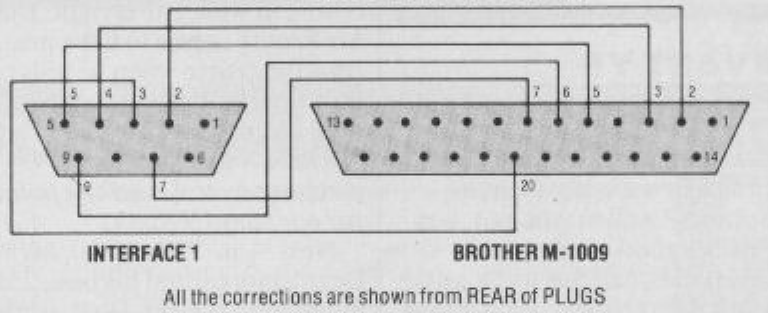
BROTHERLY LOVE

With reference to Alastair McIntyre's letter, published in Forum, *YS* issue 11, I too have a Brother M-1009 Printer, and I have successfully connected it to my Spectrum and Interface 1.

I have drawn a diagram which should be of some use to Mr McIntyre, showing the connections necessary between the Interface 1 port and the Brother connector.

David Poole, Stevenage, Herts

RS232 Connections for Cable



All the corrections are shown from REAR of PLUGS

SCANDAL!

You better start taking some notice of Forth in your magazine, or else I shall be forced to sell the photographs I have of the Editor of *YS* and 'you know who!' to the Sunday papers. I shall then make myself enough money to be able to buy all the rights to *Your Spectrum* and sack you from the position you now hold.

And if I'm feeling really evil, I'll make you play *Jet Set Willy* non-stop for two days!

Mr 'T', Newry, Co Down

Oh boy, we don't half get 'em on this magazine! I really don't know what to say... yes I do — clear off, schmuck! Ed.

MC² — MY THEORY IS...

In the article Machine Code Commands (*YS*, issue 11), there was a mistake in the machine code listing. Three lines before the 'BACK' label, you've printed an instruction 'LD(23613), HL'. This should have been 'LD(23613), SP' so that when an error occured, the BACK address is POPped off and executed.

It would also be nice if you could include, in your Joystick Jury section, whether or not the games you review are easily modified to work with Interface 1 and Microdrives.

R Black, Carrickfergus, N Ireland

Thanks for the correction. As for your suggestion for Joystick Jury — yes, we'd love to be able to suggest how you modify games so that they'll work on Microdrive, but it seems that we could be liable for prosecution if we did! The copyright laws are a bit confusing as regards software, especially as there's yet to be a test-case. In the meantime, take a look at our article, Microdrivin', in this issue — just 'cause no-one else in the industry's supporting the Microdrives very much, it doesn't mean we're going to ignore them! Ed.

SOMEONE POKE PETE!

Will someone please give Troubleshootin' Pete a swift kick in the user port.

In his column, 'From The Hip' — *YS* issue 11, he warbles on about copying a one line loader down on paper if it's got a line number zero.

Line number zero cannot normally be used, and as it stands it cannot be edited either. To change line zero to another line number, do the following:

```
POKE (PEEK 23635+256*PEEK 23636)+1,x
```

Where 'x' is the number you want the line to be. It's then possible to edit the line as normal, instead of all that writing. If you wish to use the line zero in your own programs, then put the line you want at zero at the start of the program, for example '1 REM (c) MICK', and then POKE as before, but replace 'x' with zero. Line 1 then becomes line zero — good, eh?

Where can I pick up my bronze Trainspotter award?

Mick, Wolverhampton

Listen, we'll have less of this violence if you don't mind — I get enough aggrevation of the earlobe from the Ed. You're right though, I have to admit it — once again! Maybe it was my over-indulgence over the Christmas period that made me forget that particular method. And why, I ask myself, are you content to achieve a mere bronze standard Trainspotter award — what about silver and gold? Still this is all immaterial 'cause you're not getting nothin' anyway. Troubleshootin' Pete.

EVERY PICTURE ...

Firstly, may I congratulate you on a superb magazine; you have successfully produced a good mix of games versus programming/peripheral articles with just enough light-hearted comment to make it very readable. And while I'm here, can I make a couple of points arising from articles in the December/January issue?

In answer to Richard Harrison's letter (Forum, *YS* issue 10) transferring commercial programs on to Microdrive for ease of use, Troubleshootin' Pete suggests that including a 'Microdrive SAVE' option in commercial programs is the obvious solution, but that there's no real gain to software houses. Hah! Wrong Pete ... our *Assembler* and *Monitor* programs contain this option, and I feel that the good-will thus generated outweighs any piracy problems, especially as full Microdrive compatibility is

essential for such utilities.

With regard to the various versions of the Interface 1 ROM highlighted in Andy Pennell's article (Interface ROMS — The Inside Story, *YS* issue 10), both our *Assembler* and *Monitor* are compatible with versions 1 and 2 of this ROM (detection of the ROM type is automatic). As the hook codes are not sufficiently flexible for the needs of our software, we have had to CALL routines in the Microdrive ROM, bypassing the hook codes. So, complete compatibility is possible with all Interface 1 ROMs ... and don't let anyone tell you any different!

Martin Ridout, Picturesque

Couldn't agree more, Martin. Since we began the final stages of YS *MegaBasic, one of our major concerns was to make sure it was Microdrive compatible as well as operational with all the Interface 1 ROMs Sinclair Research could throw at us. How else would we be able to complain bitterly about software houses' treatment of the ZX Microdrives, if we did the same thing ourselves? Ed.*

THE CRUELLEST CUT OF ALL

Someone in their great wisdom has placed the *YS MegaBasic* coupons so that they back on to pages of text, and I'd like to know if you'll accept other bits of the magazine in their place. You don't really want me to cut your fine produce, do you?

Kenneth Hardacre, Yorkshire

A photocopy of the coupon will do just fine ... or if you wait a couple of issues, you'll be able to take your pick of the coupons as there'll be one in each! The artist responsible for the ghastly error was threatened with having to work on one of the other computer mags — so I don't think we'll have any trouble from that quarter again. Ed.

KEYBOARD COWBOYS?

Could you please help us regarding Fuller Micro Systems of Liverpool? We've tried to 'phone the company unsuccessfully on five different numbers about my son's keyboard which he saved for out of his paper-round earnings. We have written to Fuller asking why the order has not been fulfilled, but we have never received a reply.

My son is most upset over this as it's a lot of money for a young boy.

Mrs Spring, Stockport, Cheshire

Unfortunately, as you will have probably realised by now, Fuller has gone into liquidation so I'm afraid the chances of your son getting his money back look bleak. We've also just heard rumours that the company who took over Fuller, Nordic Systems, have also gone bust! Quite where this will leave customers who've ordered keyboards, we'll just have to wait and see. Sorry not to be of more help at the moment ... but as soon as we at YS *find out what's happening up there in Liverpool, you'll be the first to know! Troubleshootin' Pete.*

AVAST YE PIRATES!

I have a master plan for the total annihilation of software pirates as we know them in Britain — well maybe not, but it' still a good idea.

Instead of all this fast loading headerless rubbish, what about a totally pirate-proof system for about £1-£2 above the normal cassette price? Sounds pretty good, huh?

Well, here it is — dongles!! No, I'm not swearing at you, I'm talking about a relatively cheap piece of hardware that would plug in the expansion bus. It would be about the size of one of the small Sinclair Research games cartridges, and there would be separate dongle for each commercially available title. The small dongle would be plugged into the interface each time the software was to be used — and, if the dongle wasn't there, the program would crash.

But the use of the dongle doesn't stop at just protection — it could also be made into a simple sound synth, or a beep amp, or even a joystick interface.

Although this would probably be only of interest to the larger software houses (and may raise the price of the cassette by a couple of quid) this is surely a better price to pay rather than the havoc created by software piracy.

Chris Hall, Belfast, N Ireland

Dongles are not exactly new. Companies like Microdeal have already tested the market with them. Unfortunately, dongles add extra cost to the package purely to protect the manufacturer and they aren't totally pirate-proof anyway! However, your idea of building a practical use into the dongle sounds quite good and could provide the incentive for shelling out the extra cash. Troubleshootin' Pete.

MIS-READ?

I feel that it is time to set the record straight. In his reply to the letter 'MIS-TIMED' in *YS* issue 9, Troubleshootin' Pete got it *right.* (It's not often he's right, so please put this in big print!).

John Kinory, on the other hand, got it wrong when he claimed that TP's answer to Patrick Fox's letter on the Ian Beardsmore article was wrong.

Pete said that "The Spectrum doesn't do a normal NEW, it performs a system reset", in which he is right. But Mr Kinory seems to have mis-read the article when he tells of how the NEW is *not* a system reset, just as Pete explained.

There — one piece of pedantry over. (*And one point for our team! TP*).

Next — in *YS* issue 10, Mr Beardsmore listed his base 255 numbering system. Well, while it is indeed a useful system, it's not base 255. Take my word for it, it's base 256!

Still, I like the mag — it's nice to see a computer magazine that's not aimed at 14-year olds!

Alan Potter, Glasgow

It's nice to have someone stand up for me now and again — and while we're proving John Kinory wrong, I had a word with Ian over the timings in Spectrum Crash Theory and he told me that his measurements were taken with an Issue 2 Spectrum with a coakroach. So Ian was right, you're right and (wowee!) I'm right too! Troubleshootin' Pete.

GREETINGS FROM ALPHA

On behalf of the entire population of Alpha. Centuri, may I inform ol' Captain Critical (*YS* issue 11) that we saved ourselves from the black hole over six months ago, and we don't want any interfering busibodies unbalancing the delicate equilibrium of life we have going up here. Got that?

Anyway, I must say that we got a big shock up here on this distant planet when it appeared that you were going bi-monthly (it's logical thinking from the Dec/Jan issue). This would have been disasterous to our economy! The newsagent industry would go sharply down-hill — the Alpha Centuri Culture Council has made *YS* compulsive throughout the whole planet — but with only six issues a year, the consequences would be unthinkable!

Zrable Greenspam, Member of the Generally Unco-ordinated Joystick Club, Alpha Centuri

RGB ADAPTATIONS

In your Dec/Jan issue, you mentioned the RGB interface for the Speccy from Adapt Electronics. I thought that your readers might be interested in a few details.

Fitting: it plugs into bus, but it doesn't have an expansion port. So, if you have other goodies, like joystick interfaces without through ports, then you could be in for a spot of bother. As I only bought the interface, I didn't have this problem!

Setting up: the RGB socket on the side of the interface has a pinout compatible with that of the BBC Micro, so you should have no problem obtaining a monitor lead. My monitor, an Electrohome JVC, had been previously used with my Oric, so for me it was just a quick job with a hot soldering iron and a DIN plug and 'away we go' ...

A little hole in the underside of the black box allows access to the trimmer, which you may have to adjust to obtain the best results. I also had to adjust the horizontal hold on my monitor to stop the top line bending over a little — but now I have a perfect picture.

Summary: well, you lose the effect of BRIGHT 'cause everything appears as BRIGHT 1 — but this problem is easily outweighed by the brilliant colours and superb picture. No dot crawl, just good pictures. I'd recommend it to everyone.

By the way, on a completely different topic, as a Sinclair-orientated magazine, do you know how many miles the C5 does to a packet of Persil?

The Doppel-Ganger, Dodworth, Barnsley

Thanks for your comments on Adapt's excellent interface. If anyone out there wants to get hold of Adapt and find out more details, then give 'em a buzz on 01-504 2840. Oh, and I believe the C5 runs better on Bold 3, unless, of course, you're talking about the New Formula Persil Automatic ... Troubleshootin' Pete.

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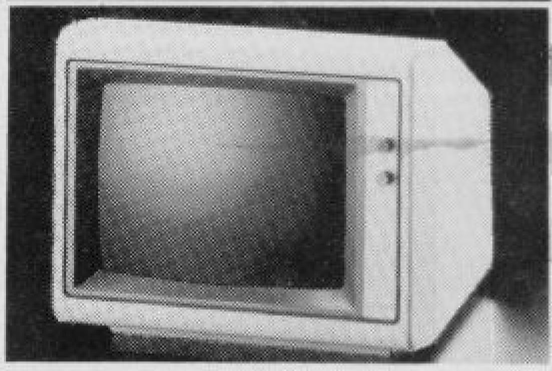
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BARCLAYCARD VISA



Card games written in Basic suffer from very slow graphics on-screen ... but if machine code's not your speciality, what do you do? Relax — the answer's here! Machine code magician,* Toni Baker *presents an amazing program to draw playing cards anywhere on-screen — just like that!

Announcing the most amazing, stupendous, phenomenally fab (*That's enough superlatives! Ed.*) program, designed to take your mind off into the land of playing cards. It's a neat little slab of machine code (well, quite a long piece really) which enables you to actually print pictures of playing cards on-screen. But the really cunning bit is that you can write your own card games program in Basic while letting my machine code get on with the hard work of drawing it.

PICTURE THAT!

The nice thing about this program is that once you've entered it into the Spectrum, all you have to do to call a deal up on-screen is to use a single line of Basic like this:

```
PRINT USR CARD, y co-ordinate,
x co-ordinate, card-number, suit
```

And that's it! When the Spectrum tries to

You'll need a Hex loader (of which there have been many published in previous issues of YS) — or better still, a monitor program — to type this lot in. Note that the data Hex code starts at 8000 Hex, and is followed immediately by the main program code (on page 23) at location 8C40 Hex. (Please note that the main program code requires you to type in the middle column only — the last column provides the source code for those using an assembler; both listings show the current address in the first column.) Make sure that you clear space in memory above 8000 Hex.

```
8000  FF 80 81 81 83 83 87 87
8008  FF 1F 0F 07 83 81 C3 C3
8010  FF 6D 6D 0C FF FF 00 00
8018  FF B6 B6 30 FF FF 2A 2A
8020  FF FC F8 F0 E0 C0 60 80
8028  FF 01 01 03 07 0F 1F 17
8030  8F 8F 87 87 C3 E3 F1 F1
8038  E3 E7 CB CB 8A 8A 12 2A
8040  F9 08 49 69 88 8E 80 DF
8048  EA 2A 2A AA 2A 2A 2A 29
8050  88 8C 87 83 81 98 54 24
8058  17 17 17 FF FF FF 7F 7F
8060  E8 E8 EF EF EF EF EF EE
8068  12 E2 EE E9 CA 98 24 67
8070  C0 A4 A0 D0 30 4F 11 83
8078  24 12 09 16 75 F5 06 FE
8080  B8 5E 01 78 3F 9F CE A6
8088  3F 37 E3 25 25 25 25 3D
8090  EE EF EF EF EF EF EF EF
8098  A9 33 B7 EF E7 FF E3 EC
80A0  FD FA F7 EF DF BF 7F BF
80A8  0E 9E 60 BF D1 EA F7 FA
80B0  92 AA ED EB EB 0F FD 17
80B8  F1 F1 F7 F7 F7 F7 F7 F7
80C0  FF 80 80 80 81 81 83 83
80C8  FF 00 80 80 C0 C0 E0 E0
80D0  FF 01 03 07 07 0F 0F 1F
80D8  FF E7 DB B1 A0 C0 80 F0
80E0  FF F1 F9 FC FE 7F 3F CF
80E8  FF 01 F1 11 11 1D 83 C5
80F0  87 87 83 83 81 81 80 82
80F8  F0 F0 E0 E0 C0 C0 80 80
8100  1F 1F 1F 1F 3F 3F 3F 3F
8108  89 E9 88 88 CE C0 DF C0
8110  07 C3 03 03 03 03 03 04
8118  E9 F1 F9 FD FF FF FF FF
8120  87 87 9F BF 9F 87 F7 8A
8128  00 00 C0 E0 C0 03 1F 7F
8130  3F 3F 3D 38 FD FF F8 FE
8138  C0 E0 F0 CF BC EB E3 1C
8140  0F 1F 6F C6 D8 38 3B E3
8148  7F FF E1 F3 CF 87 87 DF
8150  84 83 8D B2 C2 81 80 80
8158  E7 97 9B 67 64 98 90 60
8160  FC F9 F3 E6 CC 00 FF FF
8168  DF 9F 3F 7F FF 00 FF FF
8170  E3 FF E3 C0 C0 80 80 80
8178  FF FF FF 7F 0F 01 01 01
8180  FF 80 82 82 87 87 8F 8F
8188  FF 18 0C 07 03 01 80 80
8190  FF 20 51 FF FF FF 8F E0
8198  FF 00 04 8A D1 E0 FF 7F
81A0  FF 08 1A 3B 7B F3 F7 F7
81A8  FF 03 07 0D 99 F3 E7 EF
81B0  9F 9F 8F 8F 87 87 82 F2
81B8  C0 C0 80 81 02 03 00 1C
81C0  81 B9 A1 03 13 89 F1 87
81C8  5F 57 55 15 A5 A9 AA AA
81D0  F7 F7 57 57 53 5B 4B 9A
81D8  EF EF EF EF EF AF 2F 2F
81E0  90 9C 94 95 96 99 E0 89
81E8  17 10 5E DE 5E 5E 4F CF
81F0  E4 04 FF FF FE 7C 79 73
81F8  AA 2A FF 00 7F FF 80 3E
8200  B0 BF F9 01 FD FD F9 FB
8208  2F 2F FF FF FF FF FF FF
8210  C6 98 E0 81 87 9F FF FF
8218  6F EF E7 F7 F7 F7 F7 F7
8220  66 0C B9 B3 80 80 84 8E
8228  7E FE FE FC 01 01 21 71
8230  F3 F7 F7 F7 E7 EF EF EF
8238  FF FF FF FF FF FF FF FF
8240  FF 80 83 87 87 9B BF BF
8248  FF 03 81 C0 C0 B0 F8 F8
8250  FF FF FF FF 7F 3F 2A 2A
8258  FF FF FF FF FF FF A0 BC
8260  FF FF FE FD FB F4 13 F0
8268  FF 01 03 05 CD 2D CD 0D
8270  BF 99 81 83 C7 A0 B0 B0
8278  F8 30 00 80 C0 00 01 07
8280  2A 2A 2A 2A 3A 6E AA AF
8288  A0 BC A0 A7 A0 AF A0 A1
8290  90 B0 90 90 10 D0 2F 49
8298  0D 0D 0D 0D 0D 1F F1 13
82A0  B3 BC B5 B2 B1 B9 B9 B8
82A8  FF 07 B0 06 F9 FE FD F8
82B0  AE AF 6F 2F 9F 4F A7 C3
82B8  A0 D9 67 B7 DA ED E7 EA
82C0  E9 DC B4 6C DC BC 7C FC
82C8  95 95 F5 FD EF ED ED ED
82D0  B4 B4 B4 B6 B6 B6 B6 B6
82D8  F1 E3 C7 4F 5F 7F 7F 7F
82E0  EB E1 F4 F8 FA FC FC FE
82E8  ED ED ED ED 6D 6D BD 3D
82F0  FC FC FC FC FE FE FE FE
82F8  6D 6D 6D 6D 6D 6D 6D 6D
8300  FF 80 83 87 87 9B BF BF
8308  FF 00 80 C0 C0 B0 F8 F8
8310  FF 02 05 07 0F 0C 17 3C
8318  FF 92 0A 05 F8 80 B0 80
8320  FF FF FF 7F 7F 7F 7F 7F
8328  FF 01 01 81 81 C1 C1 E1
8330  BF 99 81 83 87 8E 91 B5
8338  F8 30 01 83 C7 0F 1F 9F
8340  7C FC FC FA F7 EF DF E0
8348  C0 00 F1 03 47 8F FF 00
8350  7F BF DF EF F7 FB FD 00
8358  E1 F1 F9 FD FF FF FF FF
8360  C4 DF C4 B5 91 FF A0 A0
8368  5F 5F 6F 97 3B FD FE FF
8370  E0 F7 F6 FA FA F5 F5 EB
8378  00 FF EF EF EF EE DD DB
8380  00 FF BF BF 60 CF BF 7F
8388  5F EF F7 FF 03 F7 8F BF
8390  FF 81 83 87 8F 9F BF FF
8398  FF FF FF FF FF FE FD F8
83A0  DB DB FF FF 44 44 44 44
83A8  B6 B5 FF FF 22 22 22 23
83B0  CE 24 10 48 E5 43 03 FF
83B8  3F FF FF FF FF FF FF FF
83C0  FF 80 83 87 87 9B BF BF
83C8  FF 03 81 C0 C0 B0 F8 F8
83D0  FF 04 CA FF 7F 3F 20 3E
83D8  FF 10 7C FF FF FF 01 71
83E0  FF 43 AE FC F8 F0 50 50
83E8  FF 01 01 01 11 29 2D 2D
83F0  BF 99 81 83 87 80 80 80
83F8  F8 30 00 80 C0 00 00 00
8400  20 3C 24 24 26 27 38 27
8408  01 61 01 01 21 12 62 86
8410  50 50 50 50 50 50 A8 D4
8418  2D 2D 2D 2D 2D 2D 2D 2D
8420  80 80 80 80 81 83 87 9B
8428  00 03 1E 67 E7 E7 E7 1C
8430  12 F8 FF 7B BA DD ED ED
8438  0E 7F FF FF 7E 18 81 66
8440  54 A8 E8 94 2E 5D DD FA
8448  2D 2D 2D 2D 2D 2D AD FF
8450  A3 C3 93 93 92 BB 93 82
8458  7E DB DB DB 18 FF FF 00
8460  ED F6 F6 F7 7A FA FD 73
8468  18 81 E7 9A 42 42 BA CA
8470  BA 77 77 F7 EF EF EF FF
8478  2D FF 91 91 91 F1 F1 F1
8480  FF 80 8C 9E BF BF BF BF
8488  FF 03 61 F0 F8 F8 F8 F8
8490  FF BA BA 82 7F 40 7C 40
8498  FF ED EB 0B F8 57 55 55
84A0  FF B8 B2 67 4F 8B 13 1C
84A8  FF 01 05 0D 9D DD FD FD
84B0  9F 8F 87 83 81 81 82 BE
84B8  F0 E0 C1 81 04 DC E0 01
84C0  58 80 00 DC 20 78 43 BF
84C8  55 55 55 55 3D FD FF FF
84D0  1F 13 8B EB 97 52 10 E0
84D8  FD FD DD 9D 1D 1D 1D 1D
84E0  A1 FC 84 84 84 FE 9D BD
84E8  0F B3 E1 F0 E8 EC EA ED
84F0  C0 E0 F0 FB 7D 3D 1E 1E
84F8  00 00 00 FE FD FB F7 EF
8500  18 3F 7A F4 E8 D8 BC 7E
8508  1D 1D DD 3D 0D 53 F9 71
8510  FB F7 EF 9F FF FE FD F3
8518  EE DE DF B9 77 EF EF DF
8520  8F 8F 6F 8F BF BF 99 99
8528  5E 3D 7B F5 FD FD 99 99
8530  BF DF EF F7 F7 FB FB FB
8538  21 85 CF E7 F3 F9 FD FF
8540  FF 80 8C 9E BF BF BF BF
8548  FF 00 60 F0 F8 F8 F8 F8
8550  FF 0A 15 3E 30 5F 51 BD
8558  FF D6 3A 0B 03 7B 03 33
8560  FF C0 F8 78 B8 BF DE DC
8568  FF 01 01 01 01 01 01 01
8570  9F 8F 87 83 81 80 80 80
8578  F0 E1 C1 81 01 01 01 07
8580  B1 51 70 F0 F3 F8 F8 FC
8588  01 C1 01 01 E3 07 8F 3F
8590  E8 F0 F8 F8 7C BC DC EC
8598  19 5B 3D E7 E7 3D 5B 19
85A0  80 80 87 9F FF FE FC FC
85A8  19 F1 FA 84 07 E7 E7 67
85B0  FF 7F 3F 4F 95 E5 F9 FE
85B8  FF FF FF FE 52 53 4F 7F
85C0  FA E9 A6 9C 78 FA FF FB
85C8  05 D5 4F 25 2F 39 29 29
85D0  F9 FB FF FA F8 F9 FB FF
85D8  3F A3 FC BF 3F 3F BF FF
85E0  F2 FE F2 7E B2 BE D2 DE
85E8  4F 7F 4F 7E 4D 7D 4B 7B
85F0  F9 C8 3A FF FB F9 F8 FA
85F8  29 2F A1 FF BF 3F 3F BF
8600  FF 80 BC 9E BF BF BF BF
8608  FF 00 60 F0 F8 F8 F8 F8
8610  FF C2 75 3C 1F 10 5E A2
8618  FF 11 3A FC FF 15 F5 15
8620  FF 0C B9 F1 E1 7F 7F 7F
8628  FF 01 81 BF 21 F9 E9 EF
8630  9F 8F 87 83 81 80 80 80
8638  F0 E0 C0 81 02 02 01 3F
8640  BA 62 23 A0 B7 30 D2 90
8648  D4 14 92 0A CA 1A 32 EF
8650  31 A9 AB AB A8 AE BF 06
8658  23 3F 45 83 01 59 DD 7F
8660  81 87 9F BE F9 E7 9F FF
8668  D8 CC A0 73 F9 FC 7F 3F
8670  7F 3F 1F 1F 8F 0F FC FC
8678  F2 F2 CC CC 3D 3D FC FC
8680  4A 91 31 38 7C 7C FE FE
8688  7F BF CF E1 E7 EB ED EB
8690  FF FE FC E6 D7 B6 D4 E0
8698  88 08 08 08 88 17 21 41
86A0  07 07 07 07 1F F0 12 17
86A8  F8 F8 F8 FA FA 08 48 E8
86B0  FE FE FC FC F8 F0 E0 C1
86B8  27 2B 2D 6B 67 6B ED EB
86C0  FF 80 81 83 87 8F 9F 9F
86C8  FF 0F 07 83 C1 E0 F0 F0
86D0  FF FF FF FF FF FF AA AA
86D8  FF FF FF FF FF FF 00 0F
86E0  FF FE FC F8 F0 E0 40 C1
86E8  FF 25 5B 5B 2D 55 BB 7D
86F0  BF BF 9D 81 83 87 80 80
```

execute it, nothing will be PRINTed on-screen except for the desired card ... and that can appear anywhere you want (hence the need for x and y co-ordinates — as in the PRINT AT command). Note that printing cards does not in any way affect the normal PRINT position.

Actually, the program will allow a few variations on this theme. For example, if you make the 'card-number, suit' value equal to '0,0', you'll get a playing card face down printed up on-screen; try '0,1' and '0,2' if you want to see a red and black Joker card, respectively.

Apart from the above paragraph, you select cards to be printed on-screen as you'd expect — card-number '1' represents an ace, '2' a two, and so on, up to '13' for a King. The numbers representing the various suits are '1' for diamonds, '2' for clubs, '3' for hearts and '4' for spades. S'easy really!

For those who know anything about machine code (the ignorant hoards can ignore this paragraph), the program is actually a wee bit clever (preen, preen). That's because all those other numbers (which can, in fact, be variable names or expressions like 'X+1') after the word PRINT are not actually PRINTed — quite fortunate really because you wouldn't exactly get ecstatic over a load of silly numbers cluttering up the screen. The reasons they're ignored by normal Basic are: firstly, because the machine code routine begins with a load of POPs which have the effect of making the poor ol' Speccy 'forget' what it's supposed to do after the word PRINT (but you do have to have exactly the right number or else it freaks out); and secondly, the system variable CH_ADD is adjusted so that it points to the end of the statement — allowing the next statement to be carried out without any hassle. The program allows a couple of ROM routines to move CH_ADD and evaluate the experience at the same time.

The syntax of the card printing statement has to be exactly as I've specified. It can be a real turn-off if you get it wrong because a line which has, for example, the suit number out of range — or too many items after the word USR — can still be entered into a Basic program. You won't find out if it's wrong until you try to run it.

The only other point worth mentioning (which is actually quite important!) is that any program using the routine must have somewhere at the start of the listing, the line:

```
LET CARD=36102
```

The cards printed are eight character squares across and ten characters squares down — so you can print them anywhere on-screen that's handy!

Have fun with the routine. As I keep

```
86F8   F8 F8 70 00 81 C1 02 01
8700   AA AA AA AA 6A 59 AC 77
8708   80 86 80 80 41 2F C0 87
8710   40 40 40 20 C0 80 81 81
8718   BB 55 2D 5B 5B 25 FF 21
8720   80 80 83 9F FF BE A2 BE
8728   19 7C FD FD FD F5 F5 F9
8730   AE 59 86 80 86 80 FF 9F
8738   80 81 7E 00 66 00 FF FF
8740   F9 7F 56 56 B6 AE 6F 5F
8748   21 E1 FF F1 91 F1 79 79
8750   B9 A7 DC D3 EF EE B5 D7
8758   7D 7E BF BF 5F EF B7 69
8760   63 6C 2D CD F0 F0 FF FD
8768   F0 7F BA BA 0A 0E F1 BC
8770   7F 9F E7 D9 D6 B7 AD 6B
8778   7D BF BB D7 DF 5F AF 57
8780   FF 80 81 83 87 8F 9F 9F
8788   FF 02 01 81 C0 E0 F0 F0
8790   FF 8F 9F 9F CF C3 CF 7F
8798   FF FD FA F4 F0 EF E0 C7
87A0   FF 54 2A 1E 06 7E 46 5E
87A8   FF 09 09 15 15 23 23 37
87B0   BF BF 9D 81 83 87 88 94
87B8   F8 F8 70 00 80 C1 07 0E
87C0   3F 1F 1F 3F 78 FF 81 7F
87C8   C0 81 81 40 23 F0 78 84
87D0   47 C7 07 07 CF 0F 93 27
87D8   41 55 37 95 95 15 95 75
87E0   B6 C1 B7 95 8E 9C FF FF
87E8   1F 7F B3 21 41 9D 0C 94
87F0   B0 CF F4 FB FD FE FF FF
87F8   5F E0 13 FC 83 7F A0 DF
8800   FF 8E F6 9E A6 FD 25 DD
8808   7D F5 F5 FD F5 F5 F5 FD
8810   98 88 88 98 E7 C0 81 B8
8818   40 40 5C 4D 95 03 C3 C7
8820   87 FB 8D F6 00 FF 6B FF
8828   E8 F6 FB FD 00 FF 5A FF
8830   53 8B 8B FB 02 FC D8 F2
8838   E9 C5 AB 31 39 01 15 99
8840   FF 80 81 83 87 8F 9F BF
8848   FF 60 39 9E CF E7 F3 F9
8850   FF 83 47 2F 9F FF FF 55
8858   FF 04 8A D1 E1 F7 FF 00
8860   FF 06 04 78 F0 E0 C0 40
8868   FF 01 31 31 59 59 59 59
8870   BF BF 9D 81 83 87 80 80
8878   F9 F9 71 01 81 C1 01 0D
8880   55 55 55 55 55 55 55 55
8888   00 77 04 35 04 1C 99 66
8890   40 C0 40 C0 40 40 40 40
8898   59 59 59 59 59 59 59 59
88A0   80 80 80 87 BF FF FF FF
88A8   11 12 0C 71 BF DF AF AF
88B0   56 AB 02 78 76 BE BB DF
88B8   00 3E 81 FE AA 00 BD FB
88C0   80 80 BE BE 3D FB F7 F7
88C8   59 59 59 59 5B 5B 5B 5B
88D0   F2 FF E1 E1 E1 E1 E1 FF
88D8   77 77 7B 7B BD BD CD F1
88E0   DD DF C2 DC DF DE DE D9
88E8   7B FB C3 3B FB 7B 7B 9B
88F0   E1 EF C3 DF 87 BB BB BB
88F8   5B 5B 5B 5B 59 5B FF 59
8900   00 00 00 00 00 00 00 00
8908   00 00 00 00 00 00 00 00
8910   00 00 00 01 03 07 7F F8
8918   00 00 00 80 C0 E0 FE 11
8920   00 00 00 00 00 00 00 00
8928   00 00 00 00 00 00 00 00
8930   00 00 00 00 00 00 00 00
8938   01 01 01 01 00 00 00 00
8940   F8 C8 88 04 03 00 0F 1F
8948   1C 12 11 20 C0 FE 0F 07
8950   80 80 80 80 03 04 84 E4
8958   00 00 00 00 00 80 80 80
8960   00 00 00 00 00 00 00 00
8968   00 00 00 01 01 01 02 02
8970   2B 42 80 07 0C 38 09 0A
```

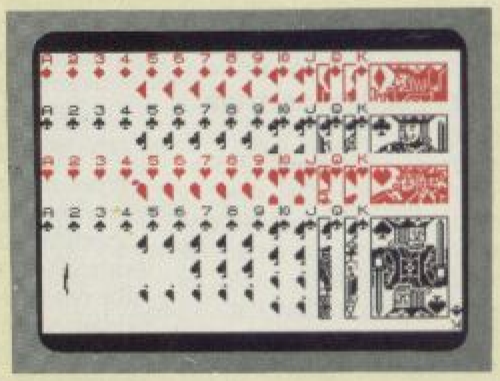
```
8978   2F BF FC F8 F8 F8 F8 F8
8980   F3 FB FF 3F 0F 07 03 00
8988   00 00 00 00 00 00 00 00
8990   00 00 00 00 00 00 00 00
8998   02 01 00 00 00 00 00 00
89A0   0C 38 C8 08 08 08 1F 3F
89A8   F0 F0 F0 F0 F0 F0 10 08
89B0   00 00 00 00 00 00 00 00
89B8   00 00 00 00 00 00 00 00
89C0   00 00 00 00 00 00 00 00
89C8   00 00 01 02 04 58 70 F0
89D0   5F 9F 1F 3F 3D 35 35 24
89D8   08 08 08 04 44 54 54 DC
89E0   00 00 00 00 00 00 00 00
89E8   00 00 00 00 00 00 00 00
89F0   00 00 00 00 00 00 00 00
89F8   E0 C0 80 40 00 00 00 00
8A00   34 10 18 08 08 08 08 08
8A08   DC F8 F8 F0 F0 F0 F0 F0
8A10   00 00 00 00 00 00 00 00
8A18   00 00 00 00 00 00 00 00
8A20   00 00 00 00 00 00 00 00
8A28   00 00 00 00 00 00 00 00
8A30   08 08 08 48 3E 1F 0F 07
8A38   F0 F0 F0 F2 7C 68 50 20
8A40   00 00 00 00 00 00 00 00
8A48   00 00 00 00 00 00 00 00
8A50   00 00 00 00 00 00 00 00
8A58   00 00 00 00 00 00 00 00
8A60   03 07 0F 3E FC 00 00 00
8A68   40 20 90 4C 3F 00 00 00
8A70   00 00 00 00 00 00 00 00
8A78   00 00 00 00 00 00 00 00
8A80   00 00 00 00 00 00 00 00
8A88   00 00 00 00 00 00 00 00
8A90   00 00 00 00 00 00 00 01
8A98   00 00 00 00 00 00 00 00
8AA0   00 00 00 00 00 00 00 01
8AA8   03 07 0E 1D 3F 70 FF BF
8AB0   00 00 00 00 00 00 00 00
8AB8   03 06 06 0E 1E 1B 3E 36
8AC0   6E EF EF DB 22 C8 83 A7
8AC8   00 00 00 00 01 01 01 03
8AD0   69 DD E3 E2 E2 9E 9E 7E
8AD8   0E 1F 60 3B BB 3B BB 1F
8AE0   03 03 03 07 07 07 06 06
8AE8   FF C7 DB BD A5 BE FE FF
8AF0   5B 1F 0F A7 83 C8 E2 78
8AF8   06 06 06 06 03 03 01 01
8B00   E7 E7 87 84 FB 74 34 BB
8B08   BF DF EE 95 7B BB BD 54
8B10   00 00 00 00 00 00 00 00
8B18   FC 63 3F 0F 00 00 00 00
8B20   EF D7 FE 0D 0D 1E 1F 1B
8B28   00 00 00 00 00 00 00 00
8B30   00 00 00 00 00 00 00 00
8B38   3A 26 27 7F 00 00 00 00
8B40   00 00 01 03 07 0F 1F 3F
8B48   00 00 00 80 C0 E0 F0 F8
8B50   1F 0F 07 03 01 00 00 00
8B58   F0 E0 C0 80 00 00 00 00
8B60   00 00 03 07 07 1B 3F 3F
8B68   00 00 80 C0 C0 B0 F8 F8
8B70   3F 19 01 03 07 00 00 00
8B78   F8 30 00 80 C0 00 00 00
8B80   00 00 0C 1E 3F 3F 3F 3F
8B88   00 00 60 F0 F8 F8 F8 F8
8B90   1F 0F 07 03 01 00 00 00
8B98   F0 E0 C0 80 00 00 00 00
8BA0   00 00 01 03 07 0F 1F 3F
8BA8   00 00 00 80 C0 E0 F0 F8
8BB0   3F 3F 1D 01 03 07 00 00
8BB8   F8 F8 70 00 80 C0 00 00
8BC0   00 10 38 7C FE 7C 38 10
8BC8   00 38 38 FE FE D6 10 38
8BD0   00 6C FE FE 7C 38 10 10
8BD8   00 10 38 7C FE D6 10 38
8BE0   00 4C 52 52 52 52 4C 00
8BE8   70 F8 0E 74 0D 74 0D F8
8BF0   F0 96 96 F0 0F 69 69 0F
```

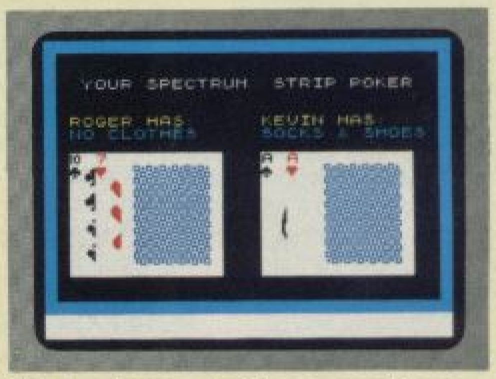
```
8BF8   08 3E 90 3D 98 3D A0 3D
8C00   A8 3D B0 3D B8 3D C0 3D
8C08   C8 3D E0 8B 50 3E 88 3E
8C10   58 3E 43 23 63 23 43 63
8C18   21 25 61 65 21 25 43 61
8C20   65 21 25 41 45 61 65 21
8C28   25 33 41 45 61 65 21 25
8C30   33 41 45 53 61 65 11 15
8C38   31 35 43 51 55 71 75 11
8C40   15 23 31 35 51 55 63 71
8C48   75 03 84 48 DF FE 2C C2
```

GRAND SLAM

The Basic program given here provides a quick demonstration of the routine at work. You can, by the way, slow down the process by adding a 'PAUSE 25' statement somewhere between lines 60 and 80.

```
1 LET CARD=36102
10 PAPER 0
20 INK 7
30 BORDER 0
40 CLS
50 FOR S=1 TO 4
60 FOR N=1 TO 13
70 PRINT USR CARD, 4*S-4, 2*N-2, N, S
80 NEXT N
90 NEXT S
```





The top demonstration screen shows the Basic listing given in action. The second screen shows a typical application. (*Hah! Ed.*)

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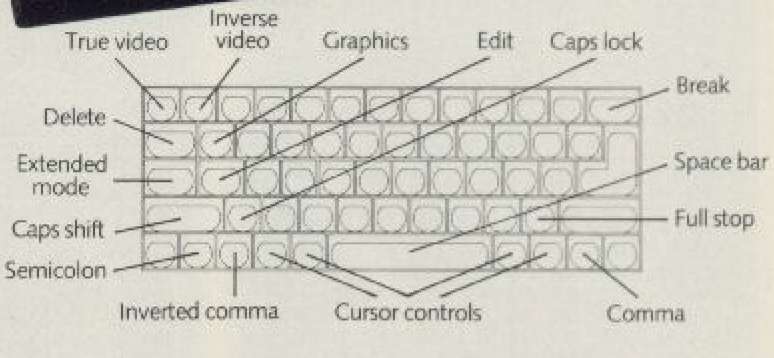
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Sinclair Research Limited,
Upgrade Department,
Stanhope Road, Camberley,
Surrey, GU15 3PS.

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BIGDEAL!

saying, don't panic just because it's all been done in machine code. If you're not too sure how to call the routine from Basic in your own program, have a look at the example listing I've given with this article. I look forward to hearing what you've managed to do with it in future Forum columns. Bye for now!

```
8C49  03        INC BC
8C4A  84        ADD A,H
8C4B  48        LD C,B
8C4C  DF        RST 18
8C4D  FE2C      CP 2C
8C4F  C28A1C    JP NZ,1C8A
8C52  E7        RST 20
8C53  CDFB24    CALL 24FB
8C56  CDD52D    CALL 2DD5
8C59  3801      JR C,01
8C5B  C8        RET Z
8C5C  CF09      RST 08/09
8C5E  2A4A8C    LD HL,(8C4A)
8C61  CB0C      RRC H
8C63  CB0C      RRC H
8C65  CB0C      RRC H
8C67  112000    LD DE,0020
8C6A  04        INC B
8C6B  1801      JR 01
8C6D  19        ADD HL,DE
8C6E  10FD      DJNZ FD
8C70  09        ADD HL,BC
8C71  5D        LD E,L
8C72  7C        LD A,H
8C73  E603      AND 03
8C75  F658      OR 58
8C77  57        LD D,A
8C78  CB04      RLC H
8C7A  CB04      RLC H
8C7C  CB04      RLC H
8C7E  C9        RET
8C7F  C5        PUSH BC
8C80  41        LD B,C
8C81  E5        PUSH HL
8C82  C5        PUSH BC
8C83  E5        PUSH HL
8C84  0608      LD B,08
8C86  1A        LD A,(DE)
8C87  DDCB0046  BIT 0,(IX+00)
8C8B  2808      JR Z,08
8C8D  4F        LD C,A
8C8E  3E01      LD A,01
8C90  CB19      RR C
8C92  17        RLA
8C93  30FB      JR NC,FB
8C95  77        LD (HL),A
8C96  DDCB004E  BIT 1,(IX+00)
8C9A  2802      JR Z,02
8C9C  1B        DEC DE
8C9D  1B        DEC DE
8C9E  13        INC DE
8C9F  24        INC H
8CA0  10E4      DJNZ E4
8CA2  DDCB0056  BIT 2,(IX+00)
8CA6  2804      JR Z,04
8CA8  7B        LD A,E
8CA9  D608      SUB 08
8CAB  5F        LD E,A
8CAC  E1        POP HL
8CAD  23        INC HL
8CAE  DDCB005E  BIT 3,(IX+00)
8CB2  2802      JR Z,02
8CB4  2B        DEC HL
8CB5  2B        DEC HL
8CB6  C1        POP BC
8CB7  10C9      DJNZ C9
8CB9  E1        POP HL
8CBA  012000    LD BC,0020
8CBD  DDCB0066  BIT 4,(IX+00)
8CC1  2803      JR Z,03
8CC3  01E0FF    LD BC,FFE0
8CC6  CB0C      RRC H
8CC8  CB0C      RRC H
8CCA  CB0C      RRC H
8CCC  09        ADD HL,BC
8CCD  CB04      RLC H
8CCF  CB04      RLC H
8CD1  CB04      RLC H
8CD3  C1        POP BC
8CD4  10A9      DJNZ A9
8CD6  C9        RET
8CD7  C5        PUSH BC
8CD8  C5        PUSH BC
8CD9  D5        PUSH DE
8CDA  0E00      LD C,00
8CDC  CD5E8C    CALL 8C5E
8CDF  D1        POP DE
8CE0  010101    LD BC,0101
8CE3  DD360000  LD (IX+00),00
8CE7  CD7F8C    CALL 8C7F
8CEA  1B        DEC DE
```

```
8CEB  C1        POP BC
8CEC  3E09      LD A,09
8CEE  90        SUB B
8CEF  47        LD B,A
8CF0  0E07      LD C,07
8CF2  D5        PUSH DE
8CF3  CD5E8C    CALL 8C5E
8CF6  D1        POP DE
8CF7  010101    LD BC,0101
8CFA  DD360003  LD (IX+00),03
8CFE  CD7F8C    CALL 8C7F
8D01  C1        POP BC
8D02  04        INC B
8D03  C9        RET
8D04  CF09      RST 08/09
8D06  11DB1F    LD DE,1FDB
8D09  E1        POP HL
8D0A  A7        AND A
8D0B  ED52      SBC HL,DE
8D0D  20FA      JR NZ,FA
8D0F  D5        PUSH DE
8D10  3E0F      LD A,0F
8D12  FD9631    SUB (IY+31)
8D15  F5        PUSH AF
8D16  CD4C8C    CALL 8C4C
8D19  C1        POP BC
8D1A  B8        CP B
8D1B  30E7      JR NC,E7
8D1D  F5        PUSH AF
8D1E  CD4C8C    CALL 8C4C
8D21  FE19      CP 19
8D23  30DF      JR NC,DF
8D25  4F        LD C,A
8D26  F1        POP AF
8D27  47        LD B,A
8D28  210008    LD HL,0800
8D2B  CD678C    CALL 8C67
8D2E  224A8C    LD (8C4A),HL
8D31  D5        PUSH DE
8D32  CD4C8C    CALL 8C4C
8D35  FE0E      CP 0E
8D37  30CB      JR NC,CB
8D39  F5        PUSH AF
8D3A  CD4C8C    CALL 8C4C
8D3D  FE05      CP 05
8D3F  30C3      JR NC,C3
8D41  4F        LD C,A
8D42  F1        POP AF
8D43  47        LD B,A
8D44  E1        POP HL
8D45  C5        PUSH BC
8D46  0C        INC C
8D47  0D        DEC C
8D48  3E39      LD A,39
8D4A  2807      JR Z,07
8D4C  CB41      BIT 0,C
8D4E  2002      JR NZ,02
8D50  3D        DEC A
8D51  3D        DEC A
8D52  3C        INC A
8D53  111800    LD DE,0018
8D56  0E0A      LD C,0A
8D58  0608      LD B,08
8D5A  77        LD (HL),A
8D5B  23        INC HL
8D5C  10FC      DJNZ FC
8D5E  19        ADD HL,DE
8D5F  0D        DEC C
8D60  20F6      JR NZ,F6
8D62  2A4A8C    LD HL,(8C4A)
8D65  01080A    LD BC,0A08
8D68  11003D    LD DE,3D00
8D6B  3E04      LD A,04
8D6D  DD21498C  LD IX,8C49
8D71  DD7700    LD (IX+00),A
8D74  CD7F8C    CALL 8C7F
8D77  010101    LD BC,0101
8D7A  CD5E8C    CALL 8C5E
8D7D  D1        POP DE
8D7E  1C        INC E
8D7F  1D        DEC E
8D80  2009      JR NZ,09
8D82  010608    LD BC,0806
8D85  11F08B    LD DE,8BF0
8D88  C37F8C    JP 8C7F
8D8B  7A        LD A,D
8D8C  A7        AND A
8D8D  2028      JR NZ,28
8D8F  010608    LD BC,0806
8D92  110089    LD DE,8900
8D95  DD7700    LD (IX+00),A
8D98  CD7F8C    CALL 8C7F
8D9B  0600      LD B,00
8D9D  11503E    LD DE,3E50
8DA0  CDD78C    CALL 8CD7
8DA3  1E78      LD E,78
8DA5  CDD78C    CALL 8CD7
8DA8  1E58      LD E,58
8DAA  CDD78C    CALL 8CD7
8DAD  1E28      LD E,28
8DAF  CDD78C    CALL 8CD7
8DB2  1E90      LD E,90
8DB4  C3D78C    JP 8CD7
8DB7  E5        PUSH HL
8DB8  D5        PUSH DE
8DB9  87        ADD A,A
8DBA  6F        LD L,A
8DBB  2600      LD H,00
8DBD  11F68B    LD DE,8BF6
8DC0  19        ADD HL,DE
8DC1  5E        LD E,(HL)
8DC2  23        INC HL
8DC3  56        LD D,(HL)
8DC4  0600      LD B,00
8DC6  CDD78C    CALL 8CD7
```

```
8DC9  D1        POP DE
8DCA  D5        PUSH DE
8DCB  7B        LD A,E
8DCC  87        ADD A,A
8DCD  87        ADD A,A
8DCE  87        ADD A,A
8DCF  C6B8      ADD A,B8
8DD1  5F        LD E,A
8DD2  168B      LD D,8B
8DD4  0601      LD B,01
8DD6  CDD78C    CALL 8CD7
8DD9  210401    LD HL,0104
8DDC  D1        POP DE
8DDD  A7        AND A
8DDE  ED52      SBC HL,DE
8DE0  2035      JR NZ,35
8DE2  010308    LD BC,0803
8DE5  11808A    LD DE,8A80
8DE8  E1        POP HL
8DE9  DD360000  LD (IX+00),00
8DED  CD7F8C    CALL 8C7F
8DF0  010601    LD BC,0106
8DF3  CD5E8C    CALL 8C5E
8DF6  010308    LD BC,0803
8DF9  11808A    LD DE,8A80
8DFC  DD360009  LD (IX+00),09
8E00  CD7F8C    CALL 8C7F
8E03  010404    LD BC,0404
8E06  CD5E8C    CALL 8C5E
8E09  010101    LD BC,0101
8E0C  11E88B    LD DE,8BE8
8E0F  DD360000  LD (IX+00),00
8E13  CD7F8C    CALL 8C7F
8E16  C9        RET
8E17  7A        LD A,D
8E18  FE0B      CP 0B
8E1A  382E      JR C,2E
8E1C  83        ADD A,E
8E1D  83        ADD A,E
8E1E  83        ADD A,E
8E1F  21C000    LD HL,00C0
8E22  54        LD D,H
8E23  5F        LD E,A
8E24  CDA930    CALL 30A9
8E27  118075    LD DE,7580
8E2A  19        ADD HL,DE
8E2B  EB        EX DE,HL
8E2C  010604    LD BC,0406
8E2F  E1        POP HL
8E30  DD360000  LD (IX+00),00
8E34  CD7F8C    CALL 8C7F
8E37  010105    LD BC,0501
8E3A  D5        PUSH DE
8E3B  CD5E8C    CALL 8C5E
8E3E  D1        POP DE
8E3F  1B        DEC DE
8E40  010604    LD BC,0406
8E43  DD360003  LD (IX+00),03
8E47  C37F8C    JP 8C7F
8E4A  E1        POP HL
8E4B  7B        LD A,E
8E4C  87        ADD A,A
8E4D  87        ADD A,A
8E4E  87        ADD A,A
8E4F  87        ADD A,A
8E50  87        ADD A,A
8E51  C620      ADD A,20
8E53  6F        LD L,A
8E54  268B      LD H,8B
8E56  E5        PUSH HL
8E57  21128C    LD HL,8C12
8E5A  0600      LD B,00
8E5C  4A        LD C,D
8E5D  1801      JR 01
8E5F  09        ADD HL,BC
8E60  0D        DEC C
8E61  20FC      JR NZ,FC
8E63  1E00      LD E,00
8E65  7E        LD A,(HL)
8E66  FE50      CP 50
8E68  380C      JR C,0C
8E6A  1C        INC E
8E6B  1D        DEC E
8E6C  2008      JR NZ,08
8E6E  E3        EX (SP),HL
8E6F  011F00    LD BC,001F
8E72  09        ADD HL,BC
8E73  E3        EX (SP),HL
8E74  1E03      LD E,03
8E76  1F        RRA
8E77  1F        RRA
8E78  1F        RRA
8E79  1F        RRA
8E7A  E60F      AND 0F
8E7C  47        LD B,A
8E7D  7E        LD A,(HL)
8E7E  E60F      AND 0F
8E80  4F        LD C,A
8E81  23        INC HL
8E82  DD7300    LD (IX+00),E
8E85  E3        EX (SP),HL
8E86  D5        PUSH DE
8E87  E5        PUSH HL
8E88  CD5E8C    CALL 8C5E
8E8B  D1        POP DE
8E8C  D5        PUSH DE
8E8D  010202    LD BC,0202
8E90  CD7F8C    CALL 8C7F
8E93  C1        POP BC
8E94  D1        POP DE
8E95  E1        POP HL
8E96  C5        PUSH BC
8E97  15        DEC D
8E98  20CB      JR NZ,CB
8E9A  E1        POP HL
8E9B  C9        RET
```

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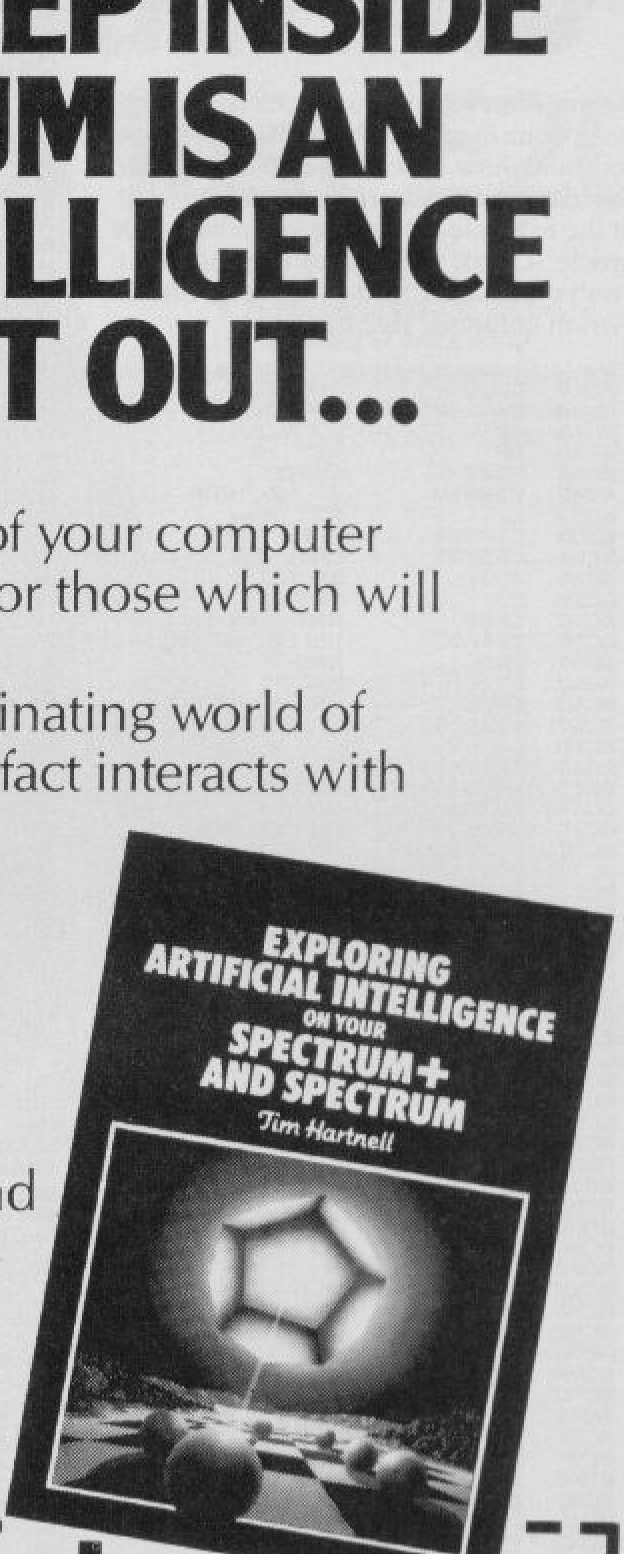
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After a hard day's night with* Heroes of Karn *and* Curse Of The Seven Faces, Clive Gifford *dials the* YS*Adventure Helpline for the lastest tricks 'n' tactics.

Well, whenever I can actually get through on the Adventure Helpline to chat to our Master adventurers (it's that busy!), it seems they've received calls from all over Europe! They've even had the odd call from frustrated adventurers working on oil rigs in the North Sea.

First, off, let's hear from **Rich Filfghbert** in Sweden. He can't work out how to get skiing in *Valkyrie 17.* OK, Rich, it's like this — type in 'READ BOOK, WEAR SKIS' and make sure you've got those ski poles handy, and away you go! Don't break a leg, Rich!

Another problem that's cropped up in *Valkyrie 17* is how and where to obtain money. Well, for a start, you could always naff off down to the village and pawn that necklace that's lying around!

There are a few adventures that I'd have expected to create floods of frustrated callers — namely, *The Hulk* and *Hampstead.* Needless to say, you're being very quiet on both of these — which means you've finished them already (*Not a hope! Ed.*) or you're still trying to crack them. In the event of the latter, here's some advice. Type 'GO DOOR' in *The Hulk* and you'll get out of the Chief Examiner's Room. and all you have to do to find the credit card in *Hampstead,* is sit and wait on the bench on Hampstead Heath. That'll do nicely!

Level 9 adventures seem to keep most of the adventuring nation awake at nights. **Dave Deals** of Sunderland can't get the can of paint through the air-lock. Aha, *Snowball,* I hear you say. Well, the answer is to put the can into the tool-box and carry on as normal. Another problem with this adventure game came from **Mr Tam** of Wallasy who wanted to know how to use the screen. Try wearing your visor, Mr Tam!

Another well regarded Level 9 game, *Lords Of Time,* prompted two questions from **Sam Whittaker** of Twickenham. So, Sam, you can leave the Invention Room by saying 'James Watt' and you can open the door on Zone nine by dropping 'Hope' (the milestone).

There was also an anonymous caller who couldn't climb the broken ladder in Phipp's *Colditz.* Hmm, not an easy one this — but try asking the prisoner to lift you up after you've fed him and you should do alright.

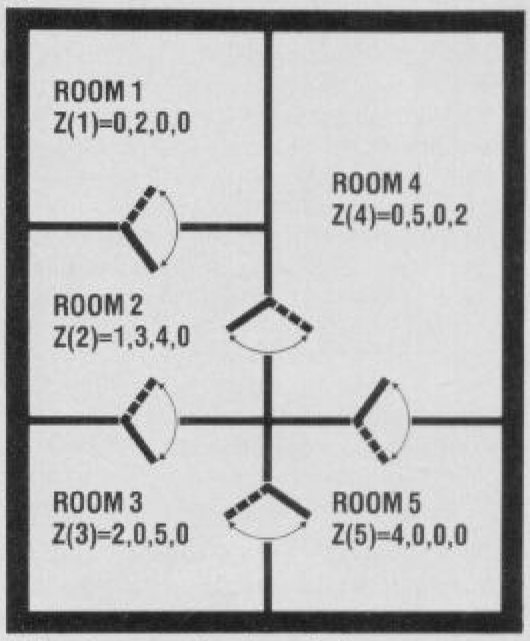
On the several adventures set in the 'classic quest style. Artic's *Eye Of Bain* hasn't attracted quite the interest it deserves, but we did have a question from **Richard Ellis** of London. He's having trouble freeing himself from the strong pole in the hut near the start of the adventure. Oh boy, Richard! Try lifting the pole ... and do call again if you've got any more problems.

In *Adventure Quest,* a number of people have confessed that they're having difficulties sorting out what to do with the egg. Obscene suggestions aside, try going South from the Glowing Coals and depositing the egg in the nest.

YS ADVENTURE HELPLINE
England and Wales: Gary Smart (0264) 59489 and Peter Marment (0264) 66660.
Scotland: Neil Mackintosh 041-332 2216.

ROUTINE ADVENTURES

The hallowed halls of Castle Rathbone echo to the sounds of Green Goblin Peter Shaw, *piecing together another in a series of adventure subroutines.*



A simple room plan, here to flex your adventure programming.

This month, I'm going to be looking more at the structure of an adventure — and the result is not really a routine, more a concept that you should bear in mind once you get the programming itch!

When you're got a rough idea of what you want the room layout to look like in your adventure, you can start allocating variables; in the example we'll be looking at here, array Z () is used to represent the various locations.

The diagram shows the aeriel view of a *very* simple adventure — you'll not find any unfriendly dragons to kill — there are just five rooms, and that's it! Now, getting back to the array Z(), our task is to dimension it so that we can store all the necessary details. Say we dimension the array:

```
DIM Z(5,4)
```

This gives us five by four elements in the array Z() to fill. Bearing in mind the formula Z(N, S, E, W) — where 'N', 'S', 'E' and 'W' indicate North, South, East and

'VENTURING OUT...

HEROES OF KARN
Interceptor Software £5.50

In great contrast Imperial Software's *Curse Of The Seven Faces* (the other adventure reviewed here), this game is a highly professional affair, even though it's a straight conversion from an original adventure on the Commodore 64.

The scenario isn't particularly original or even interesting, but the story on the back cover of the cassette is told with such flair that all but the most hardened adventurers will sit up and take notice! I won't go into all the sordid details, save to say that it involves you saving a kingdom from the shadow of evil. The usual stuff!

On starting the adventure, you're greeted with a splendid picture; in fact many of the locations have accompanying graphics that appear instantly and add greatly to the whole atmosphere. However, the descriptions are often too short, particularly where there's no picture to feast your eyes on.

Despite fancy graphics and a few other innovations, an adventure stands or falls by the strength of its puzzles, and the flexibility and quality of response to your, hopefully, imaginative commands. *Heroes Of Karn* is a definite success in this context. The responses are varied and entertaining, and the puzzles are tricky and, in some cases, rather obscure! For example, I eventually managed to get past the Barrowright by attacking it with a Bible — which didn't seem the most reverant thing to do at the time!



Interceptor's *Heroes Of Karn* — a puzzling adventure that's destined to become a classic?

Although *Heroes Of Karn* supports a few commands five or six words long, it's predominantly a standard adventure. However, I'd recommend it to anyone fancying a crack at a 'classic', especially if you've got a few long evenings to spare while you try and solve it!

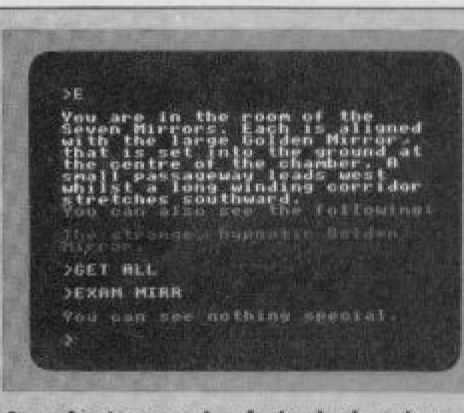
CURSE OF THE SEVEN FACES
Imperial Software/£8.95

As the software industry becomes dominated by the larger houses, many adventurers welcome releases from individuals and the like. Often the 'smaller' releases can be much more original and thoughtful than products churned out by 'big boys'. Sad to say, this isn't the case with *Curse of The Seven Faces.*

The cassette comes with a photocopied inlay card which is just fine! OK, it's not flashy paper, but who cares? But someone could have corrected some of the spelling mistakes — I mean to say, someone's even mispelt the name of the game! Anyway that said, you begin your life as a 'poor pesant', which I suppose is a humble version of a 'peasant'. I don't mean to go on about the spelling and grammatical errors, but they're there in every location. Believe me, it's difficult to get into the atmosfere I mean atmospher ... er ... atmosphere! (*See what happens when you play too many adventures, Clive? Ed.*)

The actual story line is pretty unoriginal — you've got to rescue a number of magical items (wands, cloaks and so on) from the forces of evil. Much of the adventure's quite playable, with some reasonable if uninspiring puzzles. However, the error-trapping is *very* poor. Good adventures should have a number of responses to wrong commands — some to aid the adventurer and others to entertain; needless to say, this adventure fails at both!

Once you've read 'You Cannot Do That' and 'Nothing Exciting Happens' for the umpteenth time in a row, you begin to believe it — nothing ever exciting happens! Of course, you can have some limited fun with this kind of programming — I typed in some commands ordering a hero of the piece to eat a slab of rock! And guess what was flashed up



A perfect example of a bad adventure. 'Nothing Exciting Happens'!

on the screen — yes, you've guessed it — 'Nothing Exciting Happens'. Try it yourself sometime ... and see if anything exciting happens to you!

But whether you decide to chew rocks or not, it's bound to be more exciting than this collection of bytes. One to be avoided ...

West respectively — you should begin to understand the numbers I've included on the map alongside each room. For example, take a look at Room 2 — it has an exit North, South and East, so its part of Z() would look like this:

Z(2)	1 2 3 4
2	1 3 4 0

This indicates that from Room 2 you can go North to Room 1, South to Room 3 and East to Room 4; a zero element in the West indicates that there's no exit in that direction. Geddit?

So, once you've filled the Z() array with all the data necessary for the computer to understand your map, you're ready to move around. OK, imagine you're in Room 2 and you're contemplating moving West — let's assume for this example that mS holds the command you've just typed in, and the variable 'p' is the room you're currently standing in — a line of programming would probably look something like:

```
IF m$="WEST" AND Z(p,4)=0 THEN PRINT
"THERE IS NO EXIT WEST"
```

Of course, not all maps will look like ours so you'll also need a line like:

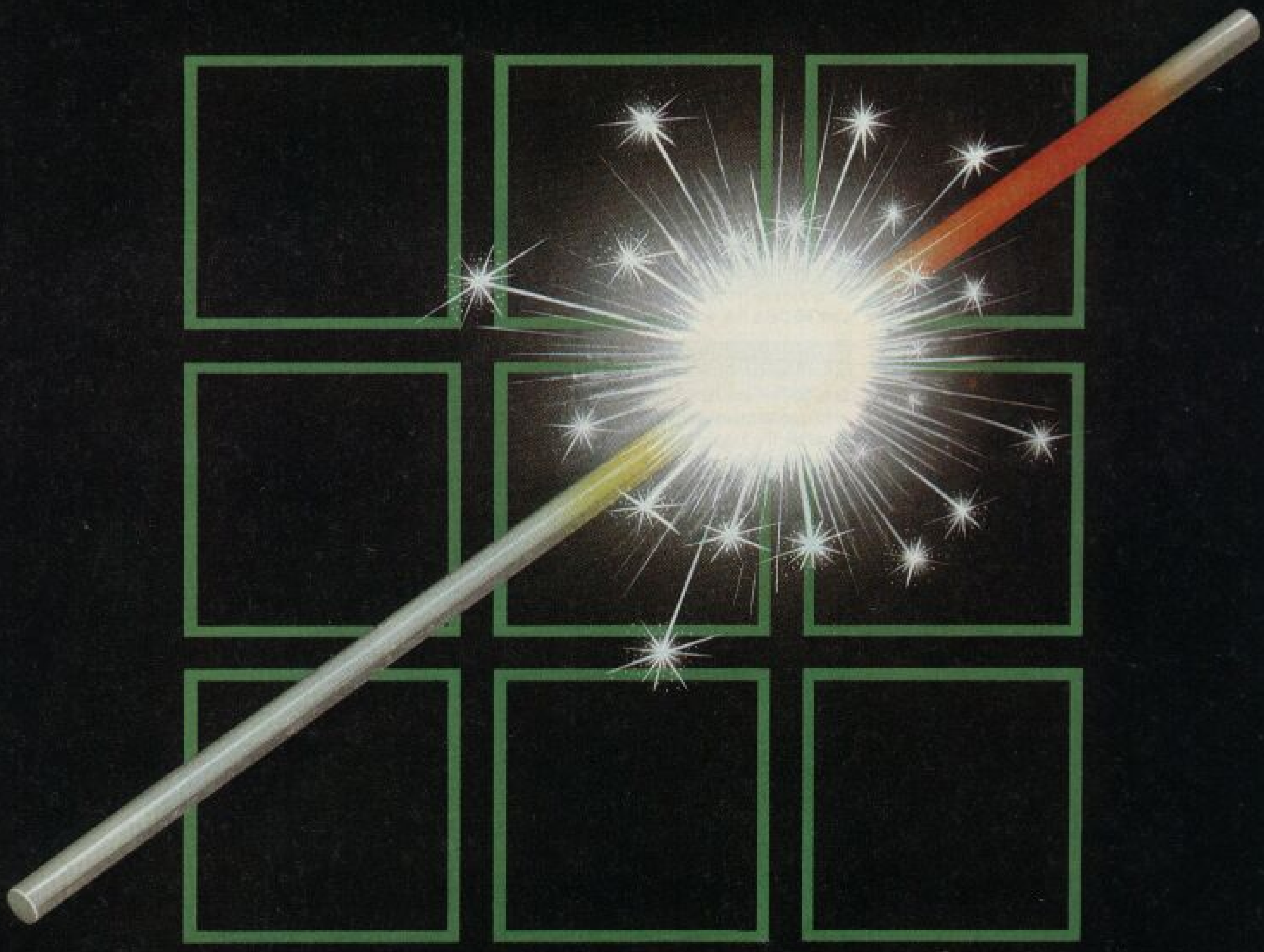
```
IF m$="WEST" AND Z (p,4)<>0 THEN LET
p=Z(p,4)
```

This will see if there's is an exit to the West and, if there is, the program sets the value of 'p' to the same value held in Z(p,4).

Next month I'll be looking at a short program combining all that we've covered so far in adventure programming.

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MEGA DEMO

1985 is the year of YS MegaBasic! _And here for your delectation is a demonstration of its capabilities, courtesy of_ YS MegaBasic _author,_ Mike Leaman.

What we have for you this month is a small demonstration listing for users of *YS MegaBasic* to test-drive their new-found Basic. Virtually each line of the listing has been described in detail so that you don't miss out on a single byte!

If you check out the screen shots given and read through the listing, you'll see that short though this program is, it'll provide you with first-hand experience of the various character fonts, sizes and stippled characters available, QL-style windows, named procedures, sound effects and a whole lot more! Of course, when you type it in you'll be able to sort out how the MegaSpectrum keyboard operates as well!

If you haven't yet succumbed to the lure of *YS MegaBasic*, then this program isn't going to put you off! Try writing the same program in ZX Basic and see how many lines of program you'll need...

Over the next few months, we'll be providing the odd demonstration listing for you to ogle over. Next month, for instance, we'll be showing you how you can create 3D graphics á la *Knightlore* in just a few simple lines of *YS MegaBasic!*

But that doesn't mean we don't want to see your own programs. Send your listings to the *YS* Towerblock and we'll get Mike Leaman to have a look at them (*And we'll be publishing the best of 'em! Ed.*). Also, if you're having any problems, write to Mike and he'll try and reply to most of them within the pages of *Your Spectrum*. Of course, if you've got a major disaster on your hands and you want help instantly, try phoning Troubleshootin' Pete on 01-636 2416 — he's only had his copy for a few weeks but he'll try and help you!

Anyway, back to you! Until *YS MegaBasic* is the only Basic on the Spectrum, *Your Spectrum*'s going to be one of the only places you can get your programs published and get some help on its mastery. So, keep watching these pages! And if you haven't yet joined the thousands of *YS MegaBasic* users ... what are you waiting for? YS

THE CURSE OF THINGS ZX!

It had to happen! Our plans to have *YS MegaBasic* ready for public consumption by January 1st, 1985, were scotched at every turn. Here at *YS*, we'd like to apologise to all who received *YS MegaBasic* a few days late — thanks for having patience with us and we hope you thought the wait worthwhile! Needless to say, all deliveries of *YS MegaBasic* are now under control. Of course, there won't be this trouble next time ...

```
16 PCLEAR
```

Line 16 Clears the PROCedure stack. You must do this at the beginning of any program that uses procedures or 'REPEAT-UNTIL' loops.

```
17 REPEAT
```

Line 17 Marks the beginning of the main program loop. (This 'REPEAT-UNTIL' loop makes the demonstration repeat itself.)

```
20 INTRO
```

Line 20 Calls the 'introduction' procedure.

```
30 WINDOWS
```

Line 30 Calls the 'windows' procedure.

```
40 GRAPHICS
```

Line 40 Calls the 'graphics' procedure.

```
50 END
```

Line 50 The 'end' procedure. This produces a scrolling 'end' message once the demonstration program's finished.

```
60 UNTIL_0
```

Line 60 Makes the demonstration repeat forever! This is equivalent to the more common 'REPEAT-UNTIL FALSE' loop you'll find in other Basics.

```
1000 @INTRO
```

Line 1000 Defines the beginning of the 'intro' procedure.

```
1003 MODE_4: CLS
```

Line 1003 Selects large size characters and clears the screen.

```
1005 WINDOW_0,0,24,64
```

Line 1005 Defines the current window so that it covers the entire screen.

```
1010 BRIGHT 0: PAPER 0:MODE_4
```

Line 1010 Sets the start-up colours for the 'intro' procedure.

```
1020 FOR F=0 TO 2
1025 FONT_F: RESTORE 1999
```



Making use of all the available character fonts and stipples, the demo's title screen includes musical accompaniment from *YS MegaBasic*'s 'SOUND' and 'PLAY' commands. This part of the program is displayed in Mode 4, where each character is 16 by 16 pixels; there's also good use of the 'STIPPLE' command.

```
1030 FOR S=1 TO 6
1040 READ Z:STIPPLE_Z
1050 FOR I=1 TO 7
1060 INK I
1070 PRINT CHR$ 3;"        YS MEGA
BASIC ";CHR$ 4;"DEMO "
1075 SREP_1:SOUND_0,0,I,2+2*F,25
5:SON
1080 VDU_2,13,4
1090 NEXT I
1095 IF (S=6) AND (I=8) AND (F=2
) THEN  GO TO 1110
1100 CLW_3
1110 NEXT S
1120 NEXT F
```

Lines 1020-1120 This loop prints 'YS MEGABASIC DEMO' on-screen in seven different colours, three different fonts and six different stipples. Line 1070 shows how you can print different size characters with the same PRINT statement; character codes 3 and 4 change the size of character output. Line 1080 produces a single-line feed, instead of a double-line feed. Line 1100 homes the cursor, but does not clear the window. Line 1075 produces a continuous sound effect.

```
1130 PRINT AT 21,0;CHR$ 3;"
  by Mike Leaman 1985";
```

Line 1130 Prints a message at the bottom of the screen in double-height characters, using control codes in the PRINT statement.

```
1140 PAUSE 100:SOFF:PLAY_0,5,0,3
0,5
```

Line 1140 Switches off the Interrupt Sound Generator (ISG) and produces another kind of sound effect using the 'PLAY' command.

```
1145 PRINT AT 21,0; PAPER 1; OVE
R 1;"
      ";
```

Line 1145 Colours the bottom two lines of the display to blue.

```
1150 CURRENT_4:WINDOW_21,0,2,28
1160 CURRENT_5:WINDOW_21,28,2,36
```

Lines 1150-1160 Set up two windows over the blue strip at the bottom of the screen.

```
1170 FOR A=1 TO 80
1180 CURRENT_4:PAN_0,-2
1190 CURRENT_5:PAN_0,2
1200 NEXT A
```

Lines 1170-1200 Split the blue strip in half by PANning in two different directions.

```
1204 INPUT ;
```

Line 1204 Sets the colour of the two input lines at the bottom of the screen.

```
1205 FOR A=1 TO 5
1210 FOR P=1 TO 7
1220 CHANGE_56,8*P
1230 PLAY_1,20,0,20,5*P
1240 NEXT P
1250 NEXT A
```

Lines 1205-1250 This routine makes the display flash in eight different colours, by switching the PAPER colour



You can have up to ten windows on-screen at any one time, all of which can be controlled independently through simple *YS MegaBasic* commands. At this stage of the demo, four windows have been created and *YS MegaBasic* is scrolling each of them, pixel by pixel, in different directions via the 'PAN' command.

using the 'CHANGE' command. Note the use of the 'PLAY' command to produce another stunning sound effect.

```
1260 ENDPROC_INTRO
```

Line 1260 Marks the end of the 'introduction' procedure.

```
1999 DATA 1,3,5,6,14,15
```

Line 1999 Contains the numbers to define the six different stipples required.

```
2000 @WINDOWS
2010 CLS
```

Lines 2000-2010 Mark the beginning of the 'windows' procedure. Line 2010 clears the screen.

```
2020 CURRENT_2:WINDOW_0,0,5,64:
PAPER 1: INK 7:MODE_2:CLW_0
2030 PRINT "YS MegaBasic can ope
rate upto 10windows  at  once  ,
 each windowcan  have  its  own
 character  size ."
```

Lines 2020-2030 Define a small window at the top of the screen and print a message in it.

```
2040 CURRENT_4:WINDOW_5,0,8,40:M
ODE_3
2050 CURRENT_5:WINDOW_5,40,8,24:
MODE_2
2060 CURRENT_6:WINDOW_13,0,8,64:
MODE_4:STIPPLE_15
```

Lines 2040-2060 Set up three different windows in different parts of the screen, all with different character sizes.

```
2070 FOR A=1 TO 150
2080 FOR W=4 TO 6
2085 CURRENT_W
2090 INK RND*7: PAPER 9
2100 VDU_(128+RND*15)
2105 IF A=150 THEN CLW_3
2110 NEXT W
2120 NEXT A
```

Lines 2070-2120 Print 150 different random characters to the three different windows in random colours.

```
2130 FOR A=1 TO 100
2140 CURRENT_2:SCROLL_0,-1
2150 CURRENT_4:PAN_0,-2
2160 CURRENT_5:PAN_0,1
2170 CURRENT_6:SCROLL_0,1
2180 NEXT A
```

Lines 2130-2180 Scroll the four different windows on-screen, all in different directions.

```
2190 WINDOW_0,0,22,64: BORDER 1:
 INPUT ;: PAPER 6: INK 1:CLW_0
2230 PRINT AT 1,2;CHR$ 1;" Windo
ws can be PANned and"'"  SCROLLe
d in all directions"
```

Lines 2190-2230 Print a message in the top left-hand corner of the screen using Mode 1 size characters.

```
2240 PLOT 4,171: DRAW 112,0: DRA
W 0,-24
2250 DRAW -112,0: DRAW 0,24
```

Lines 2240-2250 Draw a frame around the message in the top left-hand corner of the screen.

```
2260 PAN_0,120:SCROLL_0,-120
2270 FOR Z=1 TO 127:PAN_0,-1:SCR
OLL_0,1: NEXT Z
2290 PAUSE 50: CLS
```

Lines 2260-2290 PAN and SCROLL the message around the screen, pixel by pixel. Line 2290 pauses program flow for a second and then clears the screen.

```
2300 ENDPROC_WINDOWS
```

Line 2300 Marks the end of the 'windows' procedure.

```
3000 @GRAPHICS
```

Line 3000 Marks the beginning of the 'graphics' procedure.

```
3010 BORDER 7: PAPER 7: INK 1:CL
W_0
```

Line 3010 Sets the white screen and clears it.

```
3020 PRINT CHR$ 2;"Graphics can
be drawn on screen and displayed
 instantly by the  command CHANG
E ."
```

Line 3020 Prints a message at the top of the screen using Mode 2 characters. (Note the use of a control character in the PRINT statement to define the character size.)

```
3030 FOR A=1 TO 40: DRAW  INK 7;
(RND*255)-PEEK 23677,(RND*130)-P
EEK 23678: NEXT A
```

Line 3030 Draws 40 random lines on the screen (in the shape of a 'bird's nest').

```
3040 CHANGE_7,2
3050 PAUSE 50
```

Line 3040-3050 This routine makes sure that the screen is covered in red INK. Line 3050 pauses program flow for a second.

```
3055 FOR Z=1 TO 8 STEP 8
3060 FOR N=1 TO 5
3070 FOR I=0 TO 7
3080 CHANGE_7*Z,I*Z
3090 PAUSE 10
3100 NEXT I
3110 NEXT N
3120 NEXT Z
```

Lines 3055-3120 FLASH the INK colours on-screen, followed by the PAPER colours.

```
3130 PUT_2,0,0,0,22,32:FADE_0
```

Line 3130 Puts the contents of the ROM on to the screen and FADEs the display file to zero (black PAPER and black INK).

```
3140 PUT_2,0,0,0,22,32:FADE_6
```

Line 3140 Puts the contents of the ROM on-screen and FADEs to green INK and black PAPER.

```
3150 PAUSE 50: CLEAR 39999
```

Line 3150 Clears some space in RAM to store part of the screen.

```
3155 WINDOW_0,0,2,20
```

Line 3155 Defines a small window in the top left-hand corner of the screen.

```
3160 PRINT CHR$ 1;"Areas of the
screen"'"can be enlarged";
```

Line 3160 Prints a message in the window using 64 column characters.

```
3170 FOR A=1 TO 20: PAPER RND*7:
 INK 9:CLW_3: PAUSE 10: NEXT A
```

Line 3170 Highlights the window by FLASHing the PAPER colours.

```
3190 GET_0,40000,0,0,2,10
```

Line 3190 Stores the contents of the window into memory.

```
3200 SPUT_40000,0,50,3,6,10,16
3210 PAUSE 50: CLS
```

Lines 3200-3210 Place the window and its enclosed message back on-screen, enlarged three times in the x direction and six times in the y direction. Line 3210 pauses program flow for a second and clears the screen.

```
3220 ENDPROC_GRAPHICS
```

Line 3220 Marks the end of the 'graphics' procedure.

```
4000 @END
```

Line 4000 Marks the beginning of the 'end' procedure.

```
4005 INK 2
4007 CLS
```

Lines 4005-4007 Set the screen to red INK and clear it.

```
4010 SPRINT_0,0,4,5,"THE END"
```

Line 4010 Prints a message at the top of the screen in large letters.

```
4020 CURRENT_2:WINDOW_0,0,22,64
4040 CURRENT_4:WINDOW_5,0,17,64
```

Lines 4020-4040 Set up two overlapping windows.

```
4050 FOR Z=1 TO 50
4060 CURRENT_2:SCROLL_0,-1
4070 CURRENT_4:PAN_0,1
4080 NEXT Z
```

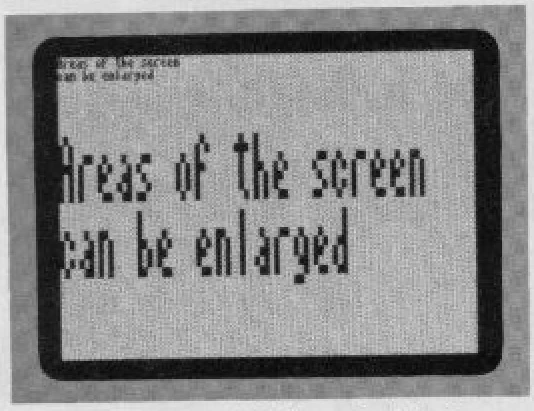
Lines 4050-4080 This routine scrolls the message downwards into the second window, which then scrolls the message sideways — this gives the slanting effect.

```
4085 PAN_0,-10
4090 PAUSE 100
```

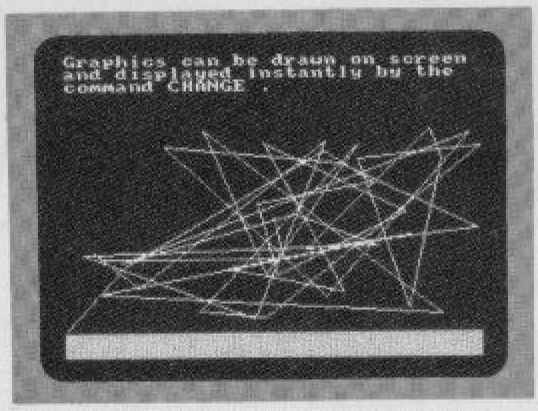
Line 4085-4090 Scroll the message to the left by ten pixels to square it up on-screen. Line 4090 pauses program flow for two seconds.

```
4100 ENDPROC_END
9999 PAUSE 0
```

Line 4100 Marks the end of the 'end ' procedure.



A major feature of YS *MegaBasic* is its ability to 'grab' a portion of the screen and place it elsewhere. Then, using the 'SPUT' command, you can enlarge the portion of the screen when it's re-printed. It's worth noting that all attribute values are retained when you're using 'GET', 'PUT' and 'SPUT'.



The 'CHANGE' command allows you to change the attributes on-screen. But here, in this section of the demonstration program, we're looking at the 'FADE' command, which lets the user create stunning explosion effects by manipulating the attributes.



The closing screen of *MegaDemo* uses the large character size mode, as well as the 'PAN' and 'SCROLL' commands to make the letters lean to the left. The entire demo program has been written using structured procedures — which means that this whole routine was called using the procedure command, 'END'.


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MICRODRIVIN' MICRODRIVIN'

Investing in a Microdrive is a relatively easy process — using it is another matter entirely! **AJ Unwin** ***offers tricks and tips on how to get around a number of seemingly insurmountable hassles experienced by Microdrive users.***

Hands up all those of you who are disillusioned with their Microdrives. The promises of faster access times and reliable storage are often not enough to encourage investment, and the expected support from the major software houses has proved non-existent.

However, Spectrum owners are well used to having to make do with what's available — and, to tell the truth, the Microdrive isn't a bad piece of kit at all ... you just have to know what you're doing!

FIRST THINGS FIRST

Our first task here is to gain some insight into the complications of shifting commercial and home-grown software from slow-loading cassette, across to the faster access Microdrives. Commercial programs available for the job are not too well reckoned and, in fact, claims of a 60 per cent success rate may be a little high — especially when you consider that most of the commercial attempts use a low RAMtop address in the programs, and any CLEAR statement with a number below 23610 makes it nearly impossible to use any Microdrive function at all!

Later on in this article, we'll be looking at a few of the shortcomings of the Microdrive itself and investigating areas that could be improved. Finally, it must be said that our thoughts here are directed towards the 48K Spectrum rather than the 16K model; most of the programs that would benefit from the Microdrive's higher access speeds are those of the longer variety. But, having said that, the 16K machine can still use most of the techniques described here.

DOUBLE TROUBLE?

There are two types of program that are particularly hard to convert for Microdrive: those that use machine code with a RAMtop too low for a Basic loader program (or even Microdrive functions); and the type of program that uses cassette-based SAVE and LOAD routines.



In general, if the code uses all the space available above RAMtop, and RAMtop is lower than 24610, then forget it! This code cannot be moved easily without resorting to machine code access of the Microdrive.

However, since most of the programs of the first type can be transferred with the help of a few tricks, that makes a good place to start. Most of the software on the market contains a Basic loader and a main section of machine code ... therefore, to be able to save the program to Microdrive, we need to know both the start and length of the code. We also need to find out the address from which to run it; look out for the 'USR xxxxx' in the Basic loader program!

The start and length of a particular program is not so easy to find, so we resort to a versatile cassette header reader like that given in this article. With these three vital pieces of information, it's a simple process to load from cassette and then save all the necessary codes to Microdrive using a line of code such as:

```
LOAD "" CODE: SAVE* "m";1; "name"
CODE start, length
```

Where 'start' and 'length' are taken from the header reader program.

A word of warning though. Some programs use the areas required by the Microdrive system itself. For instance, addresses 23734 to 23813 are used for the system when no buffers are present but, as soon as a Microdrive access is made, another 595 byte block is needed. If the command 'PRINT 23734; "to"; PEEK STKEND + PEEK (STKEND+1) * 256' gives the range which will coincide with the code, then the system could be overwritten.

However, in general, if the Microdrive block is going to be overwritten, the answer (if memory space will allow) is to load the code into a different area of memory and save it from there — remembering, of course, that the loader will need to be altered accordingly to:

```
LOAD "" CODE start2: SAVE *
"m";1;"name" CODE start2, length
```

Now, all you have to do is create a loader program with the minimum information necessary to re-load the code parts.

Owners of 16K games can make use of the fact that the top 32K in the 48K machine is effectively redundant — so you can ignore the 'CLEAR 23610' statement in the loader and keep RAMtop above 32K. For this case, use a loader of the form:

```
10 LOAD * "m";PI/PI;"name" CODE
20 RANDOMIZE USR VAL "xxxxx"
```

Where 'xxxxx' is the address the program starts execution from. Study this program for a minute or two and you'll see some weird looking statements in the loader. These will be explained more fully later on, but in short they're here to save memory since in most cases spare memory will be a scarce commodity indeed.

TWO UP

The second type of program is the one using the cassette LOAD/SAVE routines from within the program. With most program loaders, these LOAD/SAVEs are done from within this Basic program, with calls to the main code; therefore, there's no reason why it should be difficult to change all these to Microdrive versions. The code, however, may be sitting in a very low position and may need the area above for file data — try and keep the RAMtop as low as possible. This imposes large memory restrictions on our Basic program. If you're going to write a program that still incorporates all the original SAVE/LOADs, you'll have to pull some memory saving tricks out of the bag!

Take a look at the program line 'LET A=10'. Here, you can see five bytes and there are six bytes used to store the floating point representation of the number. (Check out page 122 of the Spectrum manual if you don't believe me!) As these all consume excessive amounts of memory, we'll take advantage of two ways of saving space when using numeric values.

First, make all numeric constants into variables if they're used a lot during a particular program. For example, if 'LET A=1' is converted to 'LET A=PI/PI', you'll save three bytes the first time round; then if 'a' is used to replace all the appearances of the digit '1', you'll save five bytes each time. The 'overhead', however, is that you've now got a variable 'a' using up precious space in the VARS area of memory.

The next area of conservation is when dealing with numbers that appear less frequently — for instance, if you convert RANDOMIZE USR xxxxx to RANDOMIZE USR VAL "xxxxx", you'll save three bytes each time you use it. Have a look at the table included in this article, providing a number of ways to save memory space.

Another very useful tip that I've not seen many people make use of — but which is good for extra clarity and space saving — is the idea of using labels instead of numerical references in GO TO and GO SUB statements. This not only aids reading a program but is also useful when writing/debugging since all labels are set up, say, in the first line and can then be used in assocaition with the LIST command; it's certainly much easier to remember a label than some obscure line number!

Anyway, using just some of these methods, you'll find that, by changing only the Basic bits of software you want to convert to Microdrive operation, you'll save enough room to allow it safe passage on to cartridge.

THAT DARNED CAT!

One of the greatest problems with Microdrives is their lack of filetype descriptors in the catalogues produced when using 'CAT D'. However, by clever use of the 10-byte filename allowed, the problem can be alleviated to quite a reasonable degree. The method suggested here is to adopt a name and extension to indicate a filetype (BASIC, CODE, DATA or PRINT, for example). So, to store a program written in Basic, you'd use a filename such as 'MATHS.BAS'; a code file would be stored as 'MATHS.COD'.

Other extention types that can be used are: '.TXT' for any textual files; '.PRT' for any PRINT files generated using an OPEN # statement; '.DAT' for data files; and '.TMP' for temporary files that'll only be stored for a short while. The only drawback to this is now the name part of the descriptor is now restricted to a mere six letters, but this is a small price to pay in relation to the information provided on-screen.

OPEN ACCESS

If you're the proud possessor of more than one Microdrive, you may well have come across the following problem. If you load a Basic program that autoruns and subsequently loads another lump of code from a different drive to the one it was saved on, you'll find yourself in all sorts of trouble. The reason this causes a problem is because the loader program makes explicit reference to a particular Microdrive and then tries to access it, whether or not it's the Microdrive required.

However, there's a simple solution to this problem — and it involves the following routine:

```
LET d=PEEK 23766
LOAD *"m";d;"name" CODE ... (any type of file)
```

Watch out though! The PEEK statement must not be embedded in the load statement; if you do, you'll get the 'Invalid drive number' error message flashed up on-screen. The reason this happens is probably due to the fact that the old ROM line scanner is not in use and hence, the line scanner in the Interface 1 ROM is not able to cope properly. The actual value being PEEKed here is the new system variable D__STR1; this is normally a two-byte variable, but when

CONSERVATION TABLE

Number	Equivalent Form	Bytes Saved
0	NOT PI	4
1	PI/PI	3
10	VAL "10"	3
n<255	CODE "ASCII CHR"	2

The conservation of bytes is important if you've got to lower RAMtop before Microdrive conversion can take place. Here are a few 'tricks of the trade' to get you going.

```
1070 DEF FN a(a)=PEEK a+PEEK (a+
1)*256
1080  LET d = 0 :  LET IX = 2329
6
1090  LET RDHEAD = 23400
1100
1110 FOR a=0 TO 14: READ b: LET
d=d+b: POKE 23400+a,b: NEXT a
1120 IF d<>1396 THEN  PRINT "Err
or in data line"''"Recheck befor
e RUN";: GO TO 10000: REM
                          Main P
rogram
1130 RANDOMIZE USR RDHEAD
1140 CLS : PRINT '"Name    : ";
1150
1160 FOR a=1 TO 10: PRINT CHR$ P
EEK (a+IX);: NEXT a
1170
1180 IF PEEK IX<>3 THEN  PRINT A
T 10,3; FLASH 1;"Not CODE type W
ind tape on": GO TO 1220
1190
1200 PRINT ''"Start   : ";FN a(IX
+13)
1210 PRINT '"Length : ";FN a(IX+
11)
1220 PRINT AT 21,0;"BREAK to Qui
t !!"
1230 GO TO 1130: REM
                          M/c R
outine
1240 DATA 221,33,0,91,175,55,17,
17,0,205,86,5,48,242,201
```

This is a versatile header reader program, that you'll need to find out the start and end address of the code of a particular program.

```
2090 LET IN=2410: REM Label. : R
EM                    Prompt for
printer opt.
2100 POKE 23658,8: REM Capslock
2110 LET M$="Printer on Y/N >>"
2120 GO SUB IN
2130 IF d$<>"N" AND d$<>"Y" THEN
  GO TO 2110
2140 LET P$=D$: REM
                      Prompt for
 drive no.
2150 LET M$="Drive no>>"
2160 GO SUB IN
2170 IF d$<"1" OR d$>"8" THEN  B
EEP .2,-20: GO TO 2150
2180 LET D=VAL D$
2190 CLOSE £10: REM Close stream
               : REM Create the
 cat file.
2200 OPEN £10;"M";d;"?"
2210 CAT £10;d: REM Cat to drv.
2220 PRINT £10;CHR$ 0;CHR$ 0;
2230 CLOSE £10: REM Close stream
: REM                Get catalog
ue into A$
2240 OPEN £10;"M";d;"?"
2250 LET A$=" "
2260 LET A$=A$+INKEY$£10
2270 LET J=LEN A$
2280 IF A$(J)=CHR$ 0 AND A$(J-1)
=CHR$ 0 THEN  GO TO 2300
2290 GO TO 2260: REM Repeat.
2300 CLOSE £10: REM Finished cat
: REM                Remove Temp
 file.
2310 ERASE "M";d;"?": REM
                        Print ou
t file
2320 LET s=2: REM Default Scr.
2330 IF P$="Y" THEN  LET s=3
2340 FOR A=1 TO J-2
2350 IF A$(A)<>CHR$ 13 THEN  PRI
NT £s;A$(A);: GO TO 2380
2360 IF A$(A+1)=CHR$ 13 THEN  PR
INT £s: PRINT £s,: GO TO 2380
2370 PRINT £s,
2380 NEXT A
2390 PRINT £s;"Drive:";d
2400 STOP : REM           Subrouti
ne.
2410 INPUT (M$); LINE D$
2420 IF D$="" THEN  GO TO 2410
2430 RETURN
```

This is an improved CAT program, allowing you to print up to 40 filenames up on-screen at the same time.

MICRODRIVIN'

used with Microdrives it usually contains a single byte reference to the particular Microdrive in use (since the last Microdrive used will do the same, you can use this bit of programming in your loader).

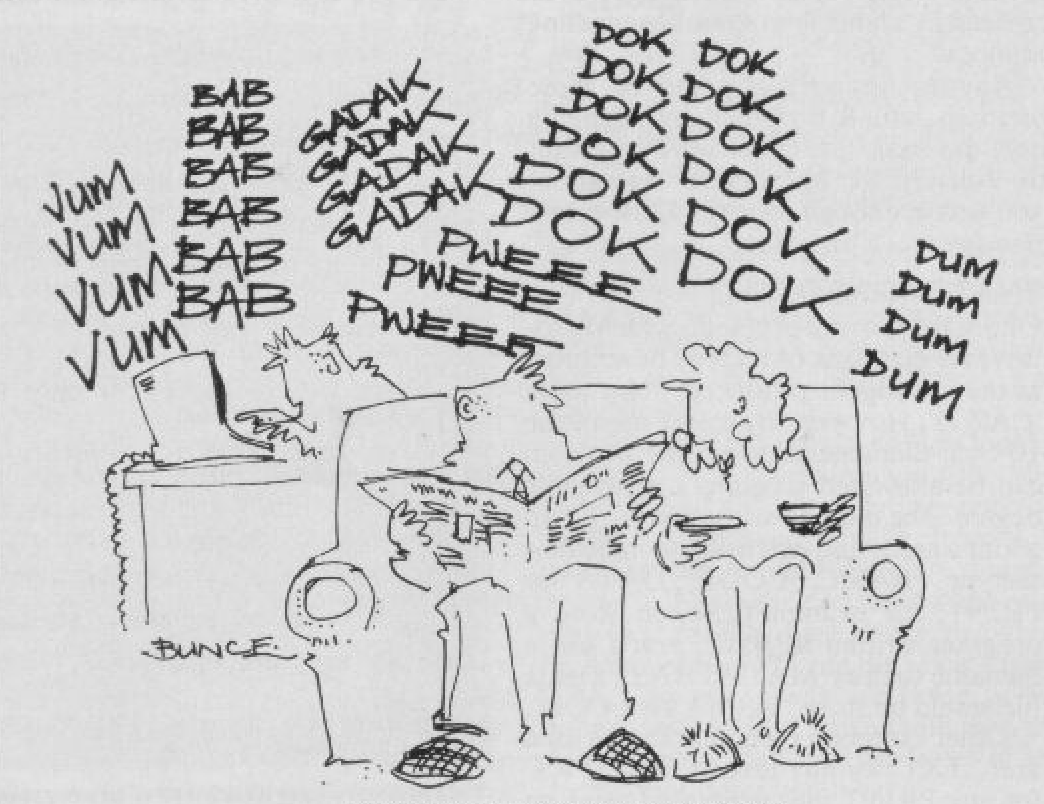
Although the loading time of the Microdrive is, in general, very fast — in fact, of the order of seven seconds maximum if the access is made in the first pass — it can be speeded up still further by utilising the technique of saving more than one copy of the program on the cartridge. You can do this by POKEing the system variable COPIES (address 23791) with the number of copies required; this number is normally set to value '1'; and will be reset to this after you have made however many copies you require. The command to carry out the saving is shown below:

```
POKE 23791,10: SAVE *"m";1;...
```

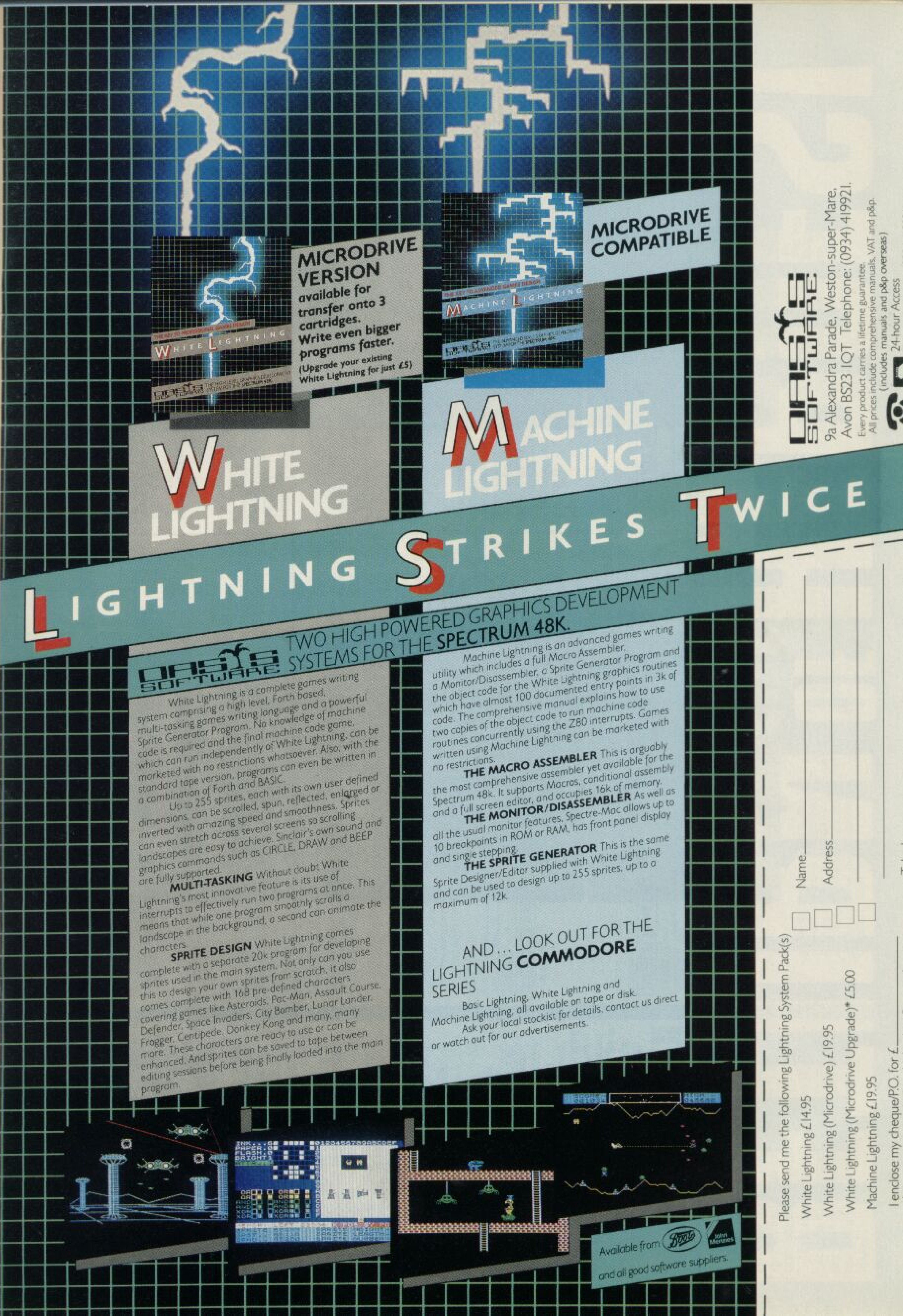
The above command would be used to save ten copies of the program specified later on in the expression. This procedure will be useful when the tape is fairly empty and it's taking a fair time to access the data.

To give you a bit of further help using the CAT command, you'll find a listing that provides an improved double-screen version of CAT. What you'll get is a catalogue of the Microdrive's contents listed in two columns, thus giving up to 40 names on-screen before the 'Scroll?' message pops up. This will mean you'll be able to see clearly what's on each Microdrive ... but the program's been geared to read only ASCII characters and not tokens; the tokens can still be read, although they might slightly upset the display format.

Well, that's it for now. Using the techniques outlined here, you should be able to make much more of the Microdrives. And if you've got any more hints and tips for those attempting Microdrivin', let's be hearing from you ... we have the technology, but there's still a fair way to go before the Microdrives come up to the usefulness of disk drives on other home computers. Go for it! YS



I think I preferred it when he was addicted to glue


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White Lightning is a complete games writing system comprising a high level, Forth based, multi-tasking games writing language and a powerful Sprite Generator Program. No knowledge of machine code is required and the final machine code game, which can run independently of White Lightning, can be marketed with no restrictions whatsoever. Also, with the standard tape version, programs can even be written in a combination of Forth and BASIC.
Up to 255 sprites, each with its own user defined dimensions, can be scrolled, spun, reflected, enlarged or inverted with amazing speed and smoothness. Sprites can even stretch across several screens so scrolling landscapes are easy to achieve. Sinclair's own sound and graphics commands such as CIRCLE, DRAW and BEEP are fully supported.
MULTI-TASKING Without doubt White Lightning's most innovative feature is its use of interrupts to effectively run two programs at once. This means that while one program smoothly scrolls a landscape in the background, a second can animate the characters.
SPRITE DESIGN White Lightning comes complete with a separate 20k program for developing sprites used in the main system. Not only can you use this to design your own sprites from scratch, it also comes complete with 168 pre-defined characters covering games like Asteroids, Pac-Man, Assault Course, Defender, Space Invaders, City Bomber, Lunar Lander, Frogger, Centipede, Donkey Kong and many, many more. These characters are ready to use or can be enhanced. And sprites can be saved to tape between editing sessions before being finally loaded into the main program.
Machine Lightning is an advanced games writing utility which includes a full Macro Assembler, a Monitor/Disassembler, a Sprite Generator Program and the object code for the White Lightning graphics routines which have almost 100 documented entry points in 3k of code. The comprehensive manual explains how to use two copies of the object code to run machine code routines concurrently using the Z80 interrupts. Games written using Machine Lightning can be marketed with no restrictions.
THE MACRO ASSEMBLER This is arguably the most comprehensive assembler yet available for the Spectrum 48k. It supports Macros, conditional assembly and a full screen editor, and occupies 16k of memory.
THE MONITOR/DISASSEMBLER As well as all the usual monitor features, Spectre-Mac allows up to 10 breakpoints in ROM or RAM, has front panel display and single stepping.
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RETURN OF THE HEROES!

HUNCHBACK II



"I had a hunch you'd want to know a little bit about me! After a book or two, several movies and the odd play, I starred in a classic computer game written for the Speccy called ... would'ja believe ... *Hunchback*! Now, over two years since its release, I'm back in action in *Hunchback II* ..."

"I've known Esmerelda for a while now... but she will keep getting herself trapped in towers! And I seem to be the only one gullible enough to save her ...

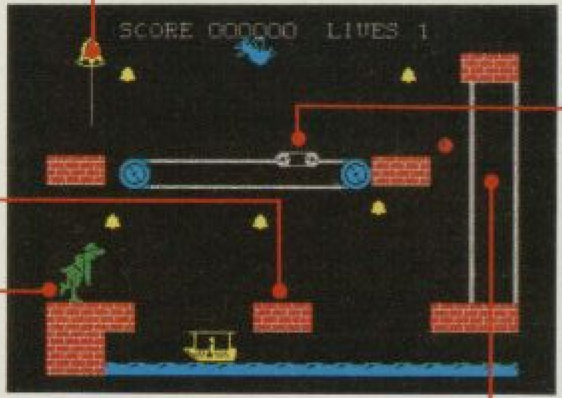
If you saw me in the original epic, *Hunchback*, you'll be pleased to know that I can walk now ... instead of mincing about on tippy-toes. I've also been given a decent set of threads — I never really felt very comfortable prancing around on-screen in a ballet outfit (not very good for the street credibility!). Also, if you're into bells (and who isn't I ask myself) — this game's full of 'em!

Someone up at Ocean must have realised that games need to be full of bright colours, lots of them. And there's far more to do in *Hunchback II*; the original just had me jumping over a few fireballs whereas here, I'm fair whacked out after just one screen! I don't know where the guards have got to this time around — perhaps it's their day off — but watch out for the malicious wildlife, they're not there to conserve *you* ... that's for sure!

Ageing rock addicts will love the blues riff in between levels ... myself, I'd have preferred something tasteful from *Duran Duran*!

All in all, a much improved game

LEVEL 2
DIFFICULTY RATING: 2/5



When you've fought your way to this point, swing on the rope — that'll ring the bell and promote you to the next level.

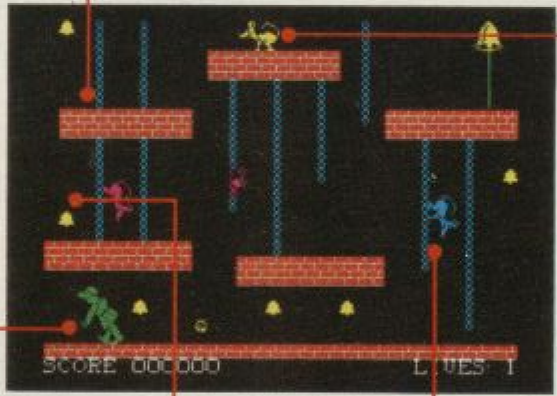
This platform is for you to jump on, in between ferry rides — if you don't want to end up in the drink, that is!

Tricky this! You have to jump on the trolley on the conveyor belt when it's travelling to the left. But make sure you time your jump carefully at the far end or you're liable to get sucked down the gap. Nasty!

Novice hunchbacks start here . . . and watch out you don't get your feet wet! You'll have to leap on to the ferry that buzzes to and fro at the bottom of the screen to get across in safety.

Once off the ferry, clamber up these ropes until you're on a level with the conveyor belt. Now, it's one small leap for mankind . . .

LEVEL 4
DIFFICULTY RATING: 3/5



From the top of this platform, all you have to do is jump across to the top right-hand corner of the screen, ring the bell and you're home free.

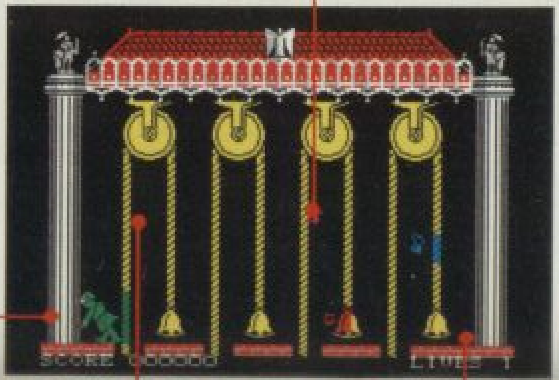
Your first aim is to get across the bottom of the screen to the rope . . . but watch out for that bat — it may not be a vampire but it's equally deadly!

You'll find that there's some pretty massive rodents (the dirty rats), eager to block your path as you traverse the chains. As you haven't got a weapon to kill them with, you'll just have to keep out of their way!

For those with nervous dispositions, this is a safe place to hide! The rats follow a set pattern of movement — it won't take you long to work out your path to safety.

To get on to the first platform, you've got to shimmy up these chains and jump for all your worth!

LEVEL 6
DIFFICULTY RATING: 4/5



There are even more bats on this screen — which doesn't make life any easier for poor ol' Quasi!

Another screen, another story — this time you've got to ring all four bells to go through to the next level.

There's a definite technique for ringing these bells

Once you've rung all four bells, leg

LEVEL 7
DIFFICULTY RATING: 3/5



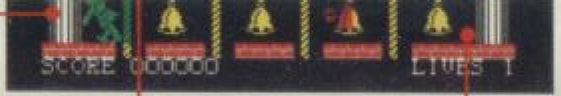
Esmerelda — looking prettier than ever! Once you've finished this screen, you'll probably have to wait three more years to see her again!

For any nostalgia fans out there, this is pretty similar to the original *Hunchback*. This time, however, you've got to run along the top of the battlements nutting the bells as you go. So that's what made ol' Quasi deaf!

The scenery is much prettier than you'll find in *Hunchback*. But it's still a waste of most of the screen, as all the action happens up there on the battlements.

Ageing rock addicts will love the blues riff in between levels ... myself, I'd have preferred something tasteful from *Duran Duran*!

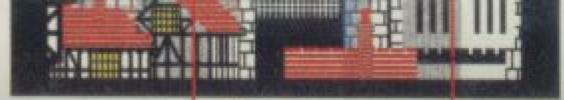
All in all, a much improved game over the original — but why take so long to sequel a game with such a good-looking hero? I hope those characters up at Ocean know what they're doing!"



There's a definite technique for ringing these bells. First, you've got to leap on to the right-hand side of the bell rope and start climbing. Once at the top, jump on to the left-hand rope. Your weight pulls the rope down and the bell rings when it hits the top.

Once you've rung all four bells, leg it to here and you'll be whisked away to the next screen.

that's what made ol' Quasi deaf!



As you jump up to get the bells, watch your landings — with that arrow flying about, they're not always happy!

The bird flies (relentlessly) across the screen, hoping to peck you as you jump for the bells.

KONG STRIKES BACK



"After being turned down for a part in the *Kong* re-make in favour of an electronic toy, I moved into the arcades and used my brute strength to push *Space Invaders* and *Pacman* out of the top machines. But, now, two years on, *Kong Strikes Back* seems a poor follow-up.

"Things have certainly changed around here since I was captured in *Kong*.

In the original game, I dumped my victim at the top of some scaffolding, and ended up throwing barrels, fireballs and everything else I could find down at ol' 'stickman' (as I used to call him!). This time, I've lugged her, screaming, to the highest place I can find in a fairground — the roller coaster! I have this feeling that I should be looking around for my old stomping ground — the Empire State Building — where I've spent many an enchanted evening with Faye and Jessica, but the people at Ocean assure me that that's irrelevant!

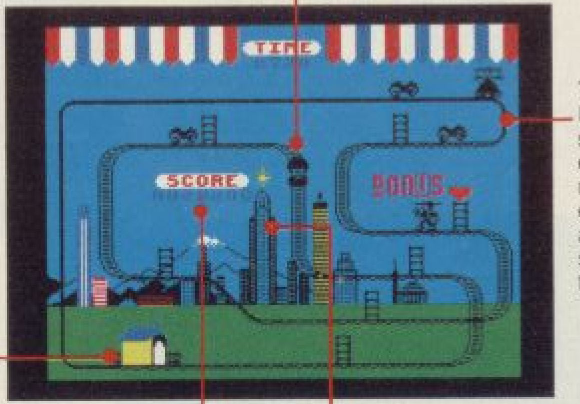
Back to the fairground and the hero of the piece (which isn't me, heh heh!) is trying to climb the roller coaster. Hmm, he seems to have put some weight on since last time we met — which should make it all the more difficult for him to avoid the four cars I'm setting in motion. Gnash, gnash — he's only got those bombs again ... still, he's only got four of them, so he'll have to watch out on the next level.

Talking of putting on weight, I must say I look a little more substantial than I did in *Kong*. Which is something I console myself with when I see how little imagination has gone into the four levels of play — OK, there are pies, springs and roller coasters cars ... but it does get a bit repetitive!

If Ocean can't do better than this, I'm back off to the jungle — maybe, me and my old big-screen chum, Faye Raye, can get a part of the latest Tarzan re-make!"

LEVEL 1
DIFFICULTY RATING: 1/5

The roller coasters move quite fast, but they're not that difficult to predict; they do, however, pick up great speed on the downhill track — probably due to the following wind!



This is the end of the roller coasters' route — once they've been round the entire circuit, they'll pass through here . . . only to reappear a matter of seconds later!

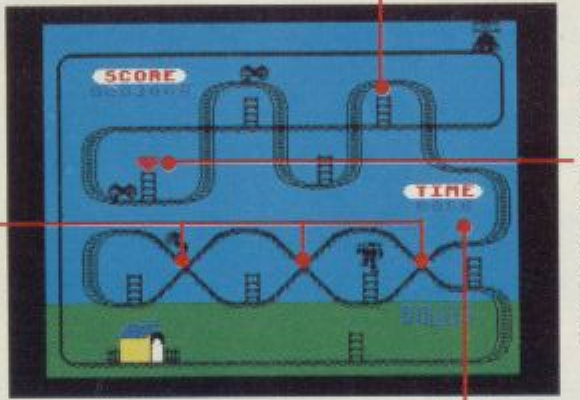
This is where Kong appears, setting the roller coaster cars in motion. You'll only see Kong for a few short seconds, so keep those eyes peeled.

The number of lives and bombs you've got left are displayed on-screen. You're given four bombs on each screen, but you've only got five lives and when they're all used up, it's curtains.

Now here's a familiar skyline — the good ol' Empire State building where Kong staged many a drama on the silver screen. Here, though, the pretty graphics are just that . . . shame!

LEVEL 2
DIFFICULTY RATING: 3/5

The ladders provide sanctuary from the roller coaster cars — in a crisis, you can let them trundle underneath while you stay safe at the top of the ladder. Watch that your head doesn't touch the track above, though — you wouldn't want to lose your head, would you?



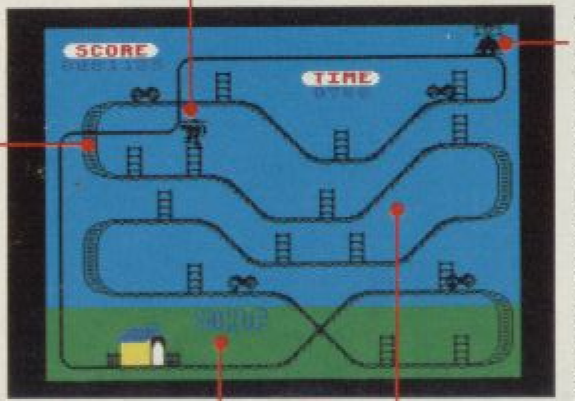
Intersections in the track certainly make life difficult. Where two tracks meet, it doesn't matter which one you're standing on — the roller coasters could get you. A little unfair — but that's life (or death!).

Above some of the ladders, you'll see the red heart shapes, tokens of your love for your sweetheart trapped in Kong's grasp. To grab some bonus points, nip up the ladders and touch them.

There's a time limit for each screen, but in the **YS** playtest this never actually proved to be a contributing factor to on-screen loss of life. Apparently, though, on higher levels, it does make things a bit awkward!

LEVEL 3
DIFFICULTY RATING: 5/5

The hero of the piece has a total of four bombs each screen — and these are designed to destroy the roller coaster cars. You've got to fire a bomb to destroy a car on the straight; as soon as a bomb tries to manoeuvre for a corner, it self-destructs!



You'll notice that when you get the hero going downhill on the track, he slides down on his backside! It's certainly quick, but he's probably got piles now..

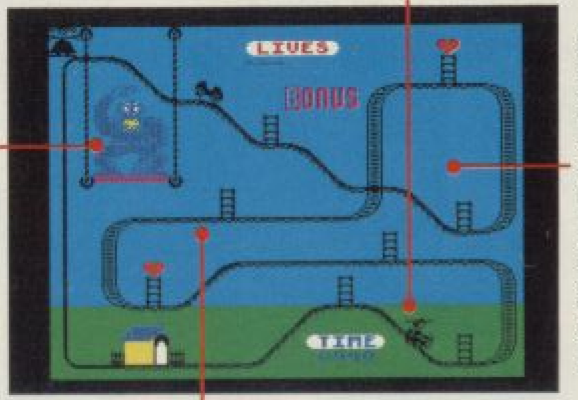
This is where the hero's sweetheart has been stashed away. Although she appears on each screen, it's only when you get on to the fourth screen that you actually get to touch her; usually, if you get anywhere near her, you're transported on to the next level!

The 'BONUS' marker here acts like a fruit machine, with each of the individual letters spinning. The idea is to collect the hearts and keep the letters spinning — and when you've got them all going, you get bonus points. Confused? You will be!

Yes, you've probably noticed by now that all the screens look pretty much alike. However, this screen is by far the hardest to complete!

LEVEL 4
DIFFICULTY RATING: 4/5

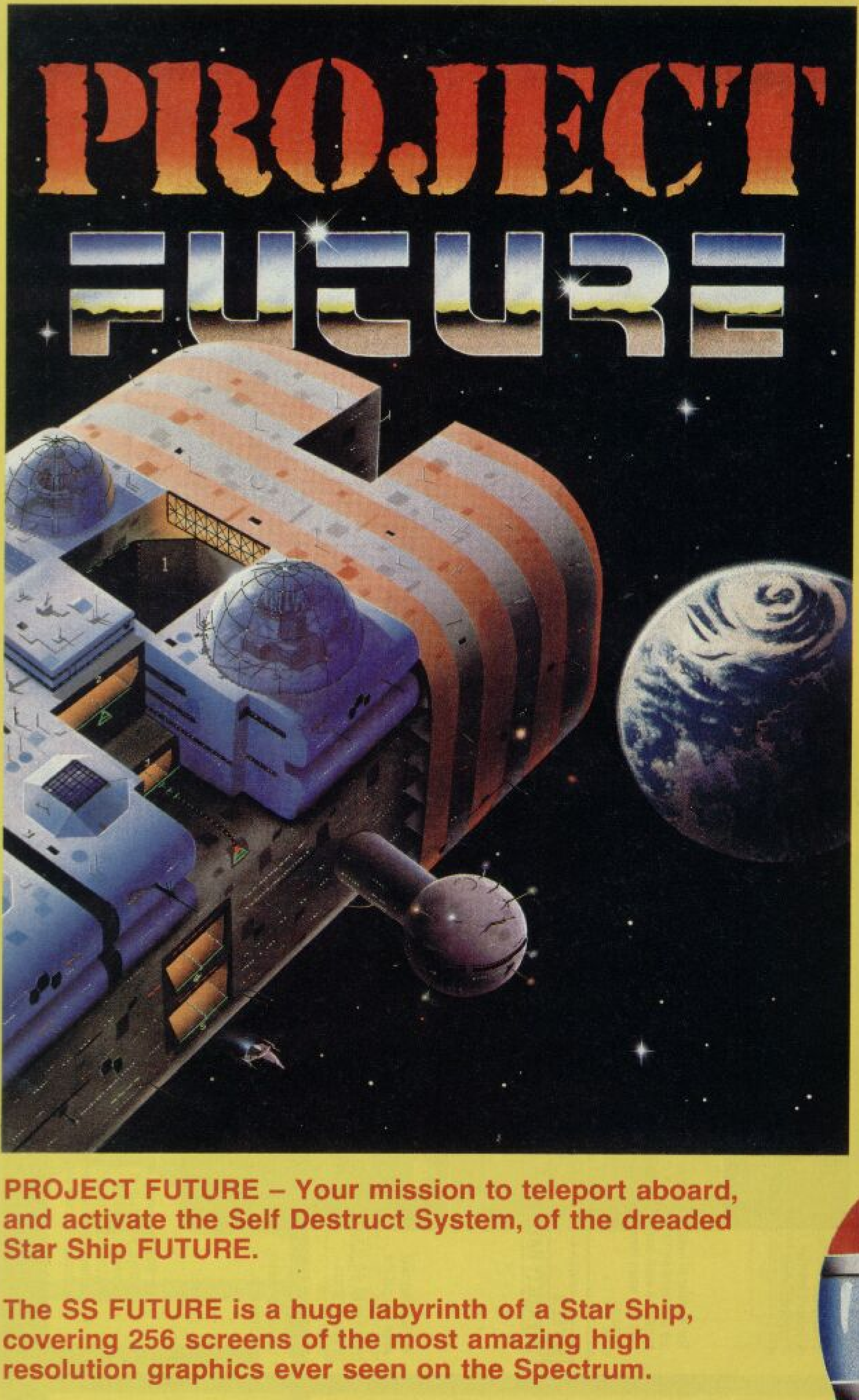
When the hero's killed, he falls on his back with his legs in the air. Not a pleasant experience!

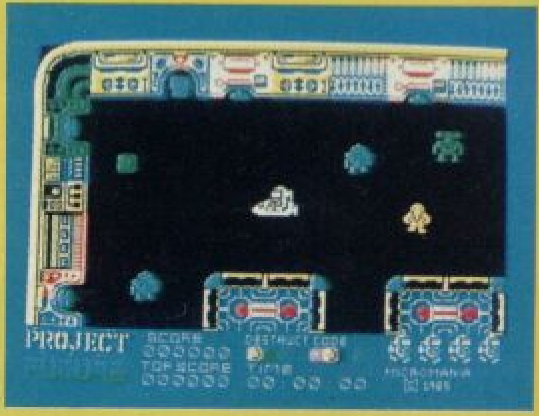


This here's your first good look at Kong. All he does is sit there like a parrot on a perch, making no contribution to the game at all. He does, however, close his eyes if you manage to catch up with your sweetheart. Thrills!

As you progress through the levels, the track may look the same . . . but some of these empty spaces are filled with all sorts of obstacles. For example, try avoiding the bowls of black custard if you can!

When you get through this level, play begins back at Level 1 again: this time, though, you collect Spectrums instead of hearts. (No-one managed to get through to the third level so we don't know if you then have to collect Spectrum+s!)







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APRIL SHOWERS

With the compliments of the season,* Dave Nicholls *and* Sue Denham *set out to track down the missing room in* Jet Set Willy. *Won't you join them?

Over the past year or so, here at *YS* we've been inundated with letters telling us how to POKE this and that in Software Projects' *Jet Set Willy*. And, not only that, but *JSW* has been a consistent contender for the number one slot in the *YS* Top 20. In fact, we get the impression you *like* the game. So much so, that we've decided to break one of the biggest trade secrets in the software industry ... and tell you that, as many suspected, there is another room in *Jet Set Willy*!

WHEN IT RAINS, IT POURS!

The missing room — April Showers — has still yet to be found. Although here in the *YS* Towerblock we heard rumours of its existence months ago, it's taken many months of codebusting before Dave Nicholls eventually cracked the code that would expose it to the world! And that's what we've got for you here...

Of course, being a 'clever clogs', Dave's not telling us where it is! We've been searching round the rooms for the past week or so and no-one in the *YS* offices can find hide nor hair of it. Of course, sneaky ol' Dave Nicholls keeps popping his head round the door, asking if anyone's found it yet. It wouldn't matter so much, but he doesn't even try to suppress his smile...

Anyway, being too busy now working on the May issue of our magnificent magazine, new editor Kevin Cox isn't letting us have any time off to search for April Showers — so it's up to you! As encouragement, though, we're going to offer a little prize — say, 10 assorted Spectrum games — for the first letter, pulled at random from Kevin's hat, telling us where the missng room is. You've got 'till the end of April to find it and write to us with its exact location. Send in your entries to the *YS* April Showers Compo, *Your Spectrum*, 14 Rathbone Place, London W1P 1DE. We look forward to your replies!

TYPING TIPS

All you have to do to uncover the missing room is to type in the listing given and save it to tape. Once you've done that, load it back into the Spectrum and RUN it. (Don't worry if the screen goes blank for a few seconds ... that's meant to happen!) When you get the 'Insert Jet Set Willy master and start tape' message on-screen, don't just sit there — get on with it! The *JSW* game will load as usual and will play as normal — except that you've now got 61 rooms!

Note that all the POKEs Software Projects gave us to cure the Attic bug and solve the problem of reaching the prize under the Conservatory Roof have been included already in the listing given, so don't try and add them again. Of course, if you want to add your own POKEs (infinite lives and so on), you can do this between lines 320 and 380 — but don't leave anything out from the listing.

And that's it! Don't forget to tell us where the missing room is. And make it soon ... it's driving us mad trying to find it! YS

```
 100 CLEAR 32767
 110 PRINT AT 5,2;"Insert Jet Se
t Willy master";AT 7,8;"and star
t tape"
 120 LOAD "jsw1"CODE
 130 LET x=61184
 140 LET line=500
 150 LET sum=0: RESTORE line
 160 GO SUB 390
 170 READ chksum
 180 IF chksum=sum THEN  GO TO 2
10
 190 GO SUB 430
 200 STOP
 210 LET x=x+8
 220 IF x<>61440 THEN  LET line=
line+10: GO TO 150
 230 LET x=41856: LET line=line+
10
 240 LET sum=0: RESTORE line
 250 GO SUB 390
 260 READ chksum
 270 IF chksum=sum THEN  GO TO 3
00
 280 GO SUB 430
 290 STOP
 300 LET x=x+8
 310 IF x<>41888 THEN  LET line=
line+10: GO TO 240
 320 POKE 42183,175
 330 POKE 42439,106
 340 POKE 60231,0
 350 POKE 59901,82
 360 POKE 56876,4
 370 POKE 64235,47
 380 RANDOMIZE USR 33792
 390 FOR y=0 TO 7
 400 READ z: POKE (x+y),z: LET s
um=sum+z
 410 NEXT y
 420 RETURN
 430 CLS : PRINT AT 5,0;"Error i
n line ";line;" !";AT 7,0;"Pleas
e check and rerun";AT 9,0;"Using
 RUN 130"
 440 RETURN
 500 DATA 170,170,170,170,170,17
0,170,170,1360
 510 DATA 192,0,0,0,0,0,0,3,195
 520 DATA 200,8,0,0,0,0,0,3,211
 530 DATA 200,8,0,0,0,0,0,2,210
 540 DATA 194,32,84,0,0,0,0,0,31
0
 550 DATA 192,65,2,0,0,1,0,0,260
 560 DATA 192,65,0,0,5,0,64,10,3
36
 570 DATA 192,64,168,0,0,0,0,3,4
27
 580 DATA 192,128,2,0,128,0,0,3,
453
 590 DATA 192,2,2,2,0,144,0,3,34
5
 600 DATA 193,0,92,0,0,20,1,3,30
9
 610 DATA 192,0,0,0,0,0,0,67,259
 620 DATA 192,0,0,2,0,0,0,19,213
 630 DATA 232,0,0,0,85,64,0,11,3
92
 640 DATA 192,128,0,0,0,0,40,3,3
63
 650 DATA 192,42,0,5,0,0,0,3,242
 66032,32,32,32,32,32,32,32,256
 670 DATA 32,32,65,112,114,105,1
08,32,600
 680 DATA 83,104,111,119,101,114
,115,32,779
 690 DATA 32,32,32,32,32,32,32,3
2,256
 700 DATA 0,0,0,0,0,0,0,0,0
 710 DATA 0,1,24,36,36,66,141,14
1,445
 720 DATA 66,60,4,24,36,36,66,14
.1,433
 730 DATA 141,66,60,2,24,36,36,6
6,431
 740 DATA 141,141,66,60,7,0,0,0,
415
 750 DATA 0,128,64,32,16,3,240,1
6,499
 760 DATA 36,66,141,141,66,60,0,
108,618
 770 DATA 94,11,0,158,95,3,0,0,3
61
 780 DATA 0,136,86,41,40,38,33,4
1,415
 790 DATA 6,0,41,0,58,0,0,0,105
 800 DATA 112,133,113,7,114,12,1
15,92,698
 810 DATA 255,0,0,0,0,0,0,0,255
 820 DATA 2,37,133,80,8,191,80,2
08,739
 830 DATA 129,97,7,16,0,185,7,25
,466
 840 DATA 18,102,12,128,2,171,64
,208,705
 850 DATA 18,34,92,48,4,183,48,1
28,555
```

This here's the listing you'll need to type in to uncover the 61st room in *Jet Set Willy*. Type in the program as it stands and save it to tape. (You can add your own POKEs between lines 320 and 380 as long as you don't take anything out — but don't bother inserting the cures for the Attic/Conservatory Roof bugs 'cause they're already there!) Now load the program back into your Spectrum, RUN it, wait for the message to come up on-screen and then play the *JSW* master tape. That's all there is to it! So, where's the room?!?

JOYSTICK JURY

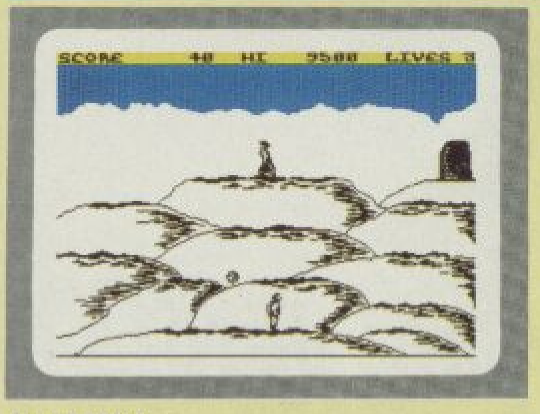
YS

Here they are again — that motley bunch of joystick jockeys, ready and waiting to sift through the plethora of software to help you make that important decision!

WARNING!
Just in case you find our scoring system too confusing, here's what it's all about. The score out of five at the end of each person's review is based on their experience of the game. But that's pretty subjective . . . so they also use the HIT and MISS system to indicate its potential as a commercial success.



From their bench on high, our regular jurors — *Ross Holman, Roger Willis* and *Dave Nicholls* — pass judgement on the latest and greatest games software!



HELLFIRE
Melbourne House/£6.95

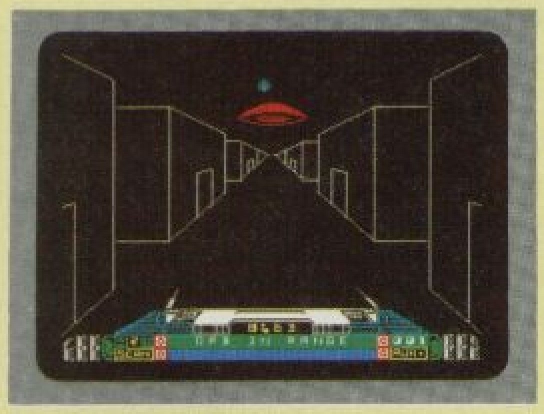
Roger: "Re-enacting the trials of Ulysses" through the good offices of arcadia should be cerebral and poetic, 'cos when Ancient Greeks did their derring-do, even a punch-up outside the boozer was worth about 48K of epic verse. But somewhere in this knockabout translation of stupendous and stirring stanzas into mundane machine code, excitement is lost and cultural dilution occurs on the same scale as the day you discover that doner kebabs contain nothing more than reconstituted donkey lung!

On-screen odysseys involve hopping up hummocks and dodging dangerous debris, to enter a sacred temple lurking inside the mountain. Erratic keyboard control suggests that our hero has already been at the Retsina. Once indoors, sneaking past terminal minotaurs by nipping from pillar to pillar is the business, followed by a maze in which monsters can be bonked on the bonce.

It took the 'real' Ulysses a fair few years of frenzied and fantastic fisticuffs to fight his way home to mum. Try to be a bit quicker, or you'll end up pulling the plug with boredom, as I did. There again, I'm only a legend in my own lunchtime . . . *1/5* **MISS**

Ross: it says on the cassette insert that it takes a week on average to complete. Well, it didn't quite take that long, but it's pretty good! *3/5* **HIT**

Dave: There's some very nice, thoughtful screens in this game but, overall, I'm not sure there's enough here for a hit. *2/5* **MISS**



BUGGY BLAST
Firebird/£5.95

Roger: Now as years come and go, the few remaining hairs get torn from my wrinkled scalp in abject frustration and anger at the production of games like this!

Sure, you can get them good ol' rocks off zapping orbital thingies, totalling heli-somethings and body-swerving round the occasional radiation-storm-in-a-teacup or, er, was it another orbital saucer? Your space/ground attack vehicle may well be splatting robotic mutant Lurgons with the photon laser or Xion phaser equivalent of a knuckle sandwich but, in the final analysis, you will still be playing *Space Invaders.* And that, if you remember, is where we all came in.

Fiddle-faddling on-screen antics lead eventually to you guiding your blaster-craft down a 3D tunnel. But then it's just a matter of zapping robots and the odd flying saucer! Thrills ...

As we tear pages off the calendar and save for our toupees, the plot thickens in both senses. 3D graphics, programming complexities and fanciful story lines may prolong active life like any reasonable dog's dinner, but it's still the same plot and you've got to be thick if you haven't noticed. *2/5* **MISS**

Ross: This one's a bit like a cross between *Star Wars* and *Time Gate.* Not a bad 'shoot 'em up' game, but not worth going 'gold' about. *3/5* **HIT**

Dave: The graphics are really nifty but, despite their prettiness, they don't make up for the game itself — it's just not original enough! *3/5* **MISS**



BLUE MAX
US Gold/£9.95

Roger: I've seen this one before — on the Atari and Commodore 64 if the ol' grey matter serves. And it was a lot better than this!

There I was, togged up to the nines ready to go off blasting at the Hun in yer typical World War I dogfight — and my on-screen jalopy looked a bit like a C5 'killer' with wings! Once you've got the hang of it, bombing factories and bridges relieves a few minor frustrations, but I reckon the whole game's based around trying to land your plane and take off again. Well, it's the only bit that gave me any real trouble! Of course, it might have had something to do with having a propellor with a single blade!

They tell me that the reason the screen's such a mess is something to do with things called 'attributes'. Well, whatever they're called, it's 'orrible!

The whole game's just a rip-off of *Zaxxon* anyway, so if you don't mind changing your surroundings to the wilds of outer space I'd plump for one of them. Bally bad luck, Ocean! *2/5* **MISS**

Ross: A very old game that offers little that's new. The attribute problems don't exactly help the graphics and there doesn't seem to be a lot going on. Let's hope other US Gold offerings turn out better than this. *1/5* **MISS**

Dave: Why has my plane only got half a propellor? Or is this just an excuse for my score? Or is it that I fell asleep with boredom? (*Answers on a postcard . . . Ed*). *1/5* **MISS**

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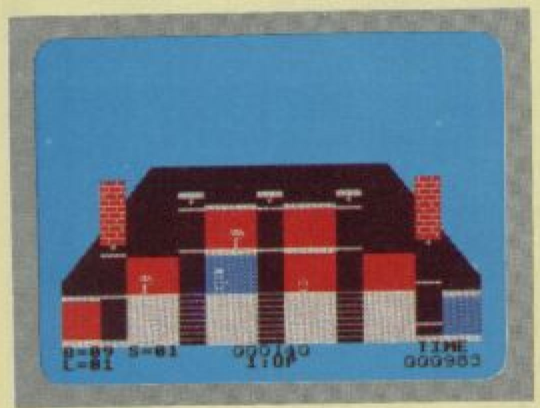
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JOYSTICK JURY



BRISTLES
Statesoft/£7.95

Roger: Toshing out the crumbling walls of the Willis ancestral pile with half a gallon of budget emulsion was never like this. *Bristles* is about painting and decorating, a subject which I sincerely doubt is close to anybody's heart, but manages an appeal to lovers of quick-fire arcade activity through a sort of covert complexity.

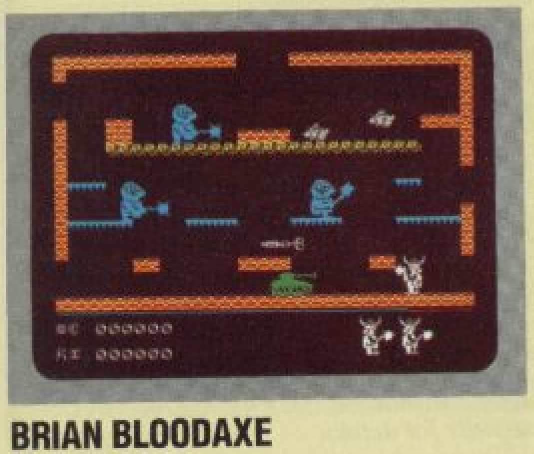
At first sight, simplistic graphics representing the eight houses to be attacked by brush — with a choice of skill levels and the odd bit of trickery stirred in to give it gloss (*sic, sic* and *sic*) — are enough to make anybody fall asleep on the job. Its speed and scoring system just about save the day, however. Climbing up the skill levels introduces any aspirant tosher to the delights of working with clear varnish or doing it in the dark.

All sorts of graphical oddities get in your way, banishing you back to the start. There are also elevators that can transport you all over the shop. However, having this info lodged in-brain did little to help me on-screen!

Why, playing this game could be just like serving an apprenticeship without getting magnolia all over the carpet. *2/5* **HIT**

Ross: The graphics are pretty awful, but the game was certainly fast. It gets really frustrating round about the sixth and seventh levels! *2/5* **MISS**

Dave: Colourful, if crude, graphics — shame about the tunes! The sort of game that gets you asking that all-important question. Why? *1/5* **MISS**



BRIAN BLOODAXE
The Edge/£7.95

Ross: *Brian Bloodaxe* is the first game to feature 'Primary Imbalance'. Hmm — presumably that means it's really zany and has whacky graphics!

As Brian (the Viking), you have to slog through some 104 screens in an attempt to collect the crown jewels, and anyone who manages it can sit on the Throne. In fact, the game's a 'Jet Set' look-alike, but one that's made more complex than most because of the need to carry up to three objects at once and use them in various locations — for example, a red key raises a red portcullis, and so on.

The graphics which inhabit the various screens are all well drawn and animated, and some are very large indeed. They'll not kill the instant you touch, but each contact reduces your energy level.

You can use the graphics to assist your progress on-screen — by hopping on and off them! The game is not as precise as *JSW* but it does offer something rather different.

Some screens repeat, which suggests there may not be 104 *unique* locations in total. On the other hand, that's more than made up for by the wide variety of things Brian is able to do. This one is worth a go! So, go for it! *4½/5* **HIT**

Dave: At first sight I thought 'Oh no! Not another platform game!'. But I was wrong — there's much more to do than usual, and the some of the graphics are superb! *4/5* **HIT**

Roger: Another *JSW* clone, but who needs it? I certainly don't — I want one where you ride a motorbike on-screen . . . go to it, you Edge people! *2/5* **HIT**



SYSTEM 15000
Craig Communications/£9.95

Dave: *System 15000* is a hacker's dream and British Telecom's nightmare! Here, you get to play a happy hacker who's been recruited to help your friend Richard recover $1.5m taken from him by REALCO, a large corporation that's got some real nasty criminal connections! The money has to be returned to Richard's company account at the Midminster bank, and to help you in your quest, there's some sophisticated communications software (called 'System 15000') that's so advanced you don't even need a phone!

Another friend, Mike, has supplied you with some initial information and a phone number to get you started — but from here on in, you're really on your own. Work your way methodically through the various passwords and phone numbers as you go — and later, rather than sooner, you'll crack the game, to the stage where you'll actually believe what you're doing; the 'ringing' and 'dialling' sounds and engaged tones make this a very realistic experience.

System 15000 is a sort of cross between adventure and strategy that'll obviously appeal to hackers everywhere. But it's also a novel idea that's worth a look just to see what Prince Phillip could be doing if he had a mind to! *4/5* **HIT**

Ross: An unusual idea this, and one that should appeal to all those would-be hackers that can't afford BT's telephone bills. *2/5* **MISS**

Roger: Half the time I couldn't tell if the game was working or not — a game for those who like looking at blank screens! *2/5* **MISS**



CYCLONE
Vortex/£6.99

Roger: Whoopee! A game that starts with a helicopter take-off sequence and flight that I can actually manage without theoretical hospitalisation — that came later! Crashing programs on my own high-mileage equipment or, even worse, Peter Shaw's much-sabotaged and hybred in-office recyclable Speccy was far more frustrating than launching *Cyclone's* rescue chopper in its urgent hunt for pain-relieving drugs.

This moderately three-dimensional saga requires pilotage of the aforesaid whirlybird in and around a seascape full of islands — don't worry, there *is* a map — to collect a vital five crates of medical supplies before the nasty cyclone upsets accident statistics, particularly those relating to, er, helicopter pilots. Don't be bored by the meteorological overtones, though, because we're not looking at weather forecast yawn quotients — this is what I call action!

Unoriginal it may be, but as one disaster area playing in another, I can only claim to have had a good time . . . *3/5* **HIT**

Ross: This is rather too similar to *TLL*, offering very little that's new. The playing area is more dispersed and there's some extra shading to show the cliffs. There are also some planes flying about, but so what! *0/5* **MISS**

Dave: Good use of the graphics techniques developed for *TLL*, but there doesn't seem to be enough going on to give it a really lasting appeal. *2/5* **MISS**



JOYSTICK JURY



THE GREAT SPACE RACE

Legend/£15

Ross: When a program's been hyped as much as *The Great Space Race,* it'd have to be something really special to live up to the expectations.

Based loosely on the 'space trader' idea, the object of the exercise is to deliver consignments of a wicked alcoholic beverage called Natof to space stations spread around the galaxy. You start by choosing up to four racers to carry the Natof, and you decide which weapons you'll use to arm their ships. All potential candidates then present themselves and state their price; you see large pictures of them on-screen, and their faces smile, wink or grimace according to your choice.

The screen splits up into three parts during the race; the top part displays a menu of options and allows you to communicate with your racers, while the lower shows textual reports. The middle section is used for graphical output — for example, the racer you're talking to, or the space station that's approaching.

The problem with *TGSR* is that it doesn't involve the player. There may be some subtle character interaction going on, but it doesn't appear to make much difference to the player and it certainly doesn't justify the ludicrous price tag. *0/5* **MISS**

Dave: This is simply a souped-up *Dictator*-type game which gives you the impression that you're not really needed anyway ... *TGSR* seems to play happily on its own. *0/5* **MISS**

Roger: Ugh! Well, compared to a party political broadcast it's great (in other words, it's dross!). *1/5* **MISS**



AIRWOLF

Elite/£6.95

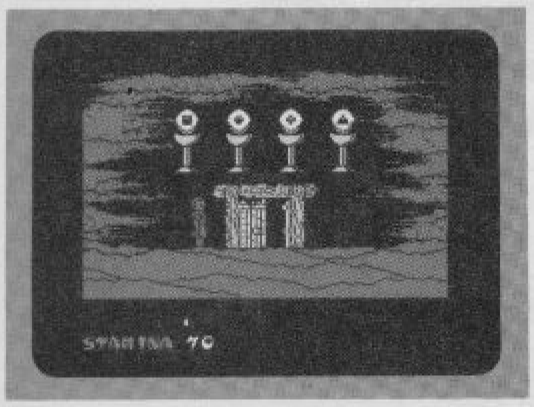
Ross: How d'you fancy being in the role of Stringfellow Hawke in Elite's officially licenced version of *Airwolf?* The plot for those who don't know, is that five important US scientists are being held hostage in an underground base and Hawke alone will rescue them.

The game is only Kempston compatible and, although the keyboard controls are very responsive, they're not laid out as well as I'd have liked. But the helicopter graphic is drawn very well indeed and certainly behaves realistically; it tilts as you fly forward and falls under the force of gravity. In fact, all the graphics are very good, and there's clever use of shading to produce depth to the backdrops and a variety of colours.

The first obstacles to stand in your way are bands of anonymous blocks and these must be destroyed quickly, allowing no time for their replacement. The trick is to rapidly move the 'copter up and down while blasting away furiously. This is the best game yet from Elite and it's pretty difficult to play. Definitely one for the masochists. *4/5* **HIT**

Dave: Pretty graphics, but *not* a very interesting game. It seems to be written in compiled Basic, and my combination of RAM Turbo interface and Quickshot 2 rapid fire crashed it wonderfully! *2/5* **MISS**

Roger: This must be one of the most frustrating affairs I've ever had with the Speccy! Good, but too difficult to hold my attention. *3/5* **HIT**



GIFT FROM THE GODS

Ocean/£9.95

Dave: This one comes in a large box, with a fairly comprehensive instruction sheet containing the storyline. The tale concerns several strangely-named people and seems to have been written to confuse potential players so that they don't realise that this is just another 'move about in the maze, collecting things and putting them in the right place' game.

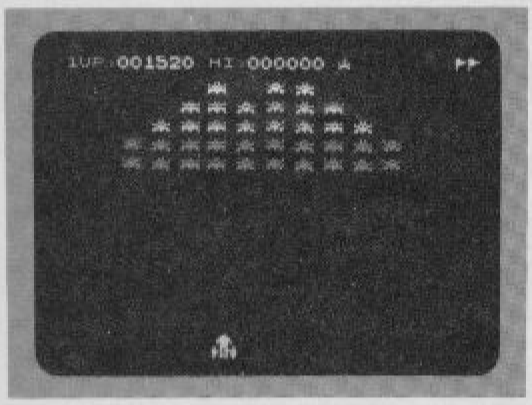
The object of this extravaganza is basically to collect the six 'Euclidian' shapes and place them in the Guardian's chamber. You're hindered in this task by the nasty Demi-Gods, as they've created lots of fake shapes to confuse you; you also have to make sure that your mother doesn't kill your sister.

Graphically, the game is very good with large sprites and several different types of 'nasty' all well animated. It also boasts an 'intelligent' joystick feature that stops you having to press loads of different keys; movements of the joystick (or keypresses) do different things when you're in certain locations!

Unfortunately, *Gift from the Gods* didn't really hold my interest, as there really isn't much to do beyond filling a large piece of paper with a map of the Labyrinth. *2/5* **MISS**

Ross: I don't think much of the Gods if this is all they can come up with for a gift. Another of the multi-millioned screen bores, but one that does contain pretty graphics. *1/5* **MISS**

Roger: Excellent graphics and . . . um . . . that's about it really! Hah, it's all Greek to me . . . *2/5* **MISS**



GALAXIAN

Atarisoft/£7.99

Dave: I'll always remember the day I walked into my local pub and discovered that the *Space Invaders* machine had been replaced with something called *Galaxians.* The shock was so great that I had to have a drink pretty quick . . . medicinal, of course, you understand!

I soon recovered and spent many happy hours (and 10p pieces) learning the movement patterns of the aliens, until I could almost play the game just by listening to the electronic blips and buzzes that accompanied you through the levels. Now Atari has brought out the home computer version for the Spectrum.

To be fair, though, there have been several other *Galaxian* variants produced for the Spectrum, some of which were very good. But Atari's is the first to include all the elements of the original, such as the movement patterns that I struggled so hard to learn. The only real difference between this and the original is in the way the meanies re-appear at the top of the screen.

OK, so this version's overpriced, but it's still one of the best 'shoot 'em up's around! If you want a trip down Memory Lane then buy it — but don't expect too much of the old fella . . . *4/5* **HIT**

Ross: Another very good Atarisoft offering that seems to have all the features of the original. The sound is good, the action fast and it plays superbly. Well worth collecting, if only for the nostalgic value. *3½/5* **MISS**

Roger: Very close to the original. The only thing missing is the pub that used to accompany it! *4/5* **MISS**

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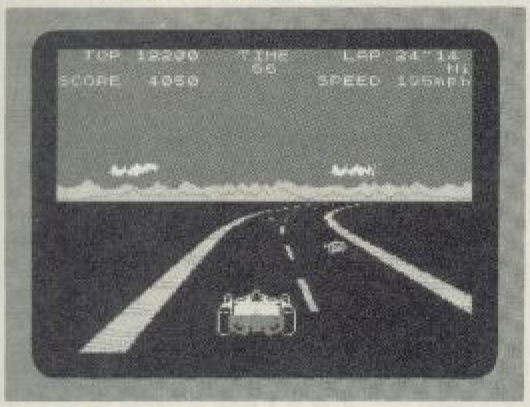
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JOYSTICK JURY



POLE POSITION

Atarisoft/£7.99

Ross: "Atari puts you in the driver's seat! Pass cars like they're standing still, but watch for those curves! One mistake and you could go up in flames!" So says Atarisoft on the cassette sleeve of *Pole Position.* All the features of the arcade original are in the Spectrum version, from the qualifying lap to the vicious left-hand bend that appears just when you think you're doing so well. All the joysticks are supported and the controls are nice and simple . . . left, right, brake and change gear.

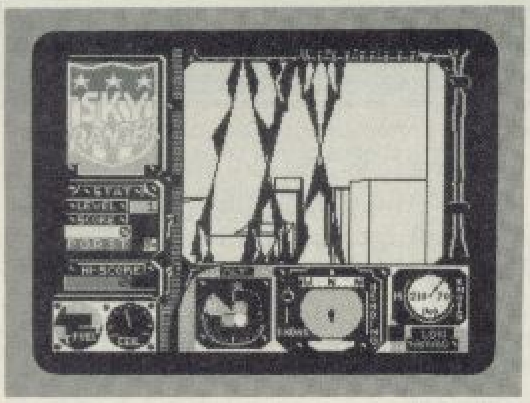
To qualify for the race you must first complete a lap within 73 seconds — and, once you've made the grade you get allocated a grid position.

Immediately the starting light turns to green, the other cars go speeding off — leaving you to do the best you can. The car accelerates automatically, leaving you to change into high gear at about 100mph. You soon start catching up with the other cars, though, and you'll get a satisfied feeling as you coast past them. Each time you complete a lap you're given a time bonus and the end of the race comes when you run out of time or complete three laps; you'll see a little chequered flag at the finish.

For my book this is the best Atarisoft game yet. It's also the best racing game I've seen on the Spectrum and it's eminently playable. *4/5* **HIT**

Dave: With the possible exception of *Full Throttle,* this has got to be the best racing game yet . . . but it's far too expensive! *3/5* **HIT**

Roger: OK, I'm smiling! This is a great game . . . better than any race game yet. Buy it! *5/5* **HIT**



SKYRANGER

Microsphere/£5.95

Ross: The 'Watchers' are computerised law enforcers of the rather over-zealous kind — and they need to be stopped. As a Skyranger, your task is to fly your jetcopter around the city, ambushing the Watchers and blasting them into smithereens with your ultrasonic pulse generator.

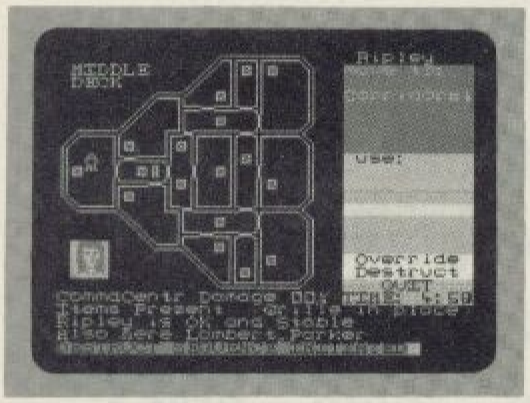
The screen has a large window at the top left which allows you to peek outside; it's surrounded by various instruments that show speed, height, fuel and the position of your foe.

The view seen from the window is one of tall buildings, drawn in 3D-style vector graphics and through which you have to manoeuvre. The 360-degrees radar shows the relative position of the Watchers and allows you to zip through the maze of streets on an intercepting course. If you manage to get in line with one, check your altitude and range, then blast it. Of course, all the time you're moving your fuel is running out.

If you manage to destroy enough Watchers, you're given a code that allows entry to the next level. Overall, I have to express disappointment. The program seems technically proficient but it lacks playability and I found myself getting bored with it. *2/5* **MISS**

Dave: Nice graphics — shame about the game! Useful practice for the day when all cities look like New York and everyone owns a helicopter. I think I'll give it a miss. *1/5* **MISS**

Roger: Very pretty, very clever . . . and what's the point! The only thing I managed to kill was myself — all in all, a very unsatisfying experience. *3/5* **MISS**



ALIEN

Mind Games/£8.99

Dave: *Alien* is like no other game I've ever seen! You get to play the commander of the space ship Nostromo which has been invaded by 'you know who'.

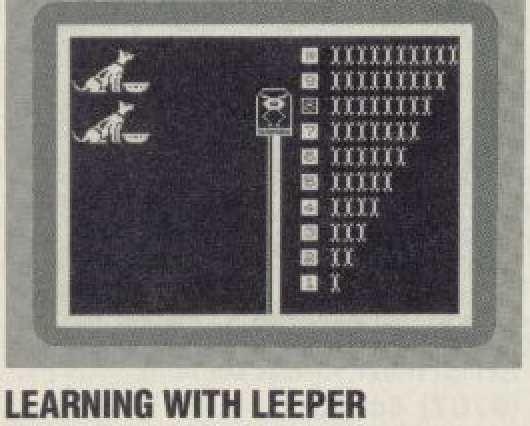
As commander, you have to realise that the crew have their own ideas (that is, they're terrified!) and won't necessarily obey all orders. Also, if you've seen the film, you won't be surprised to find out that one of the crew is a 'company' android.

The control panel consists of a plan view of the decks of the ship — only one screen at a time — and you're provided with a list of options down the right-hand side; these options change depending on the situation. All action takes place in real-time, so once an order's given, you're free to go and 'talk' to someone else while it's carried out.

All in all, a very different, and difficult strategy game that takes some time to get into but is well worth the effort. Remember in your bedroom, everyone can hear you scream — so keep it down a bit! *4/5* **HIT**

Ross: Very much an adventure game, but one that uses graphics to show what's going on and a joystick to investigate the action. But don't blink — one second, I was closing in on the Alien, the next all my crew were dead! Certainly worth a look. *3/5* **HIT**

Roger: Once I got the 'ang of what was going on, it was great. In space, you can hear me screaming for more! *5/5* **HIT**



LEARNING WITH LEEPER

Software Projects/£9.95

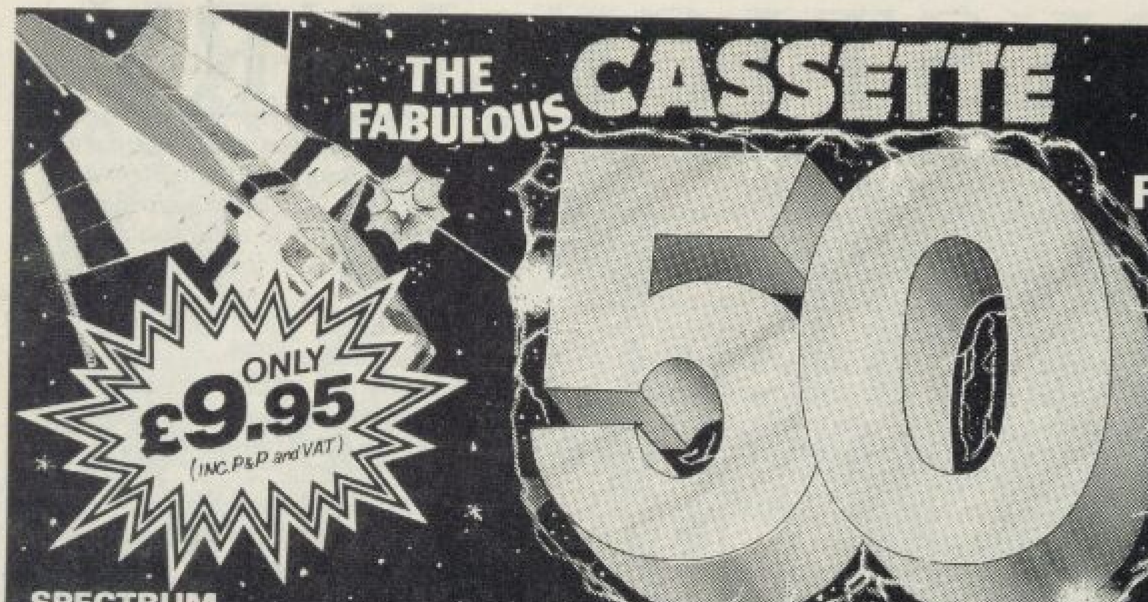
Dave: At first glance *Learning with Leeper* seems to be a very nicely produced piece of software.

On closer examination, however, I found that the programs were, in fact, written by Sierra On-Line and are only licenced by SP, and to be frank I'm not really sure why it bothered. There are four programs in the set that are supposed to help young children (three- to six-year olds) develop basic skills like pattern matching and counting. While the programs would no doubt do that if they kept the child's attention, in their present form they soon become boring because of the overlong pauses between games and the slowness of the games themselves. In fact, the four-year old that I got to try them out played each game only once before he wandered off to do something else.

If the games could be changed so that the tunes were shorter and the graphics moved faster, the package would certainly be worth another look . . . but even then, there would probably be too little variety for lasting appeal *1/5* **MISS**

Ross: I couldn't really see these four games helping anyone very much — true, they might even be entertaining . . . but they don't seem very educational. *1/5* **MISS**

Roger: If you're having problems making up bedtime stories for the young 'uns, here are four programs guaranteed to send 'em to sleep! *1/5* **MISS**



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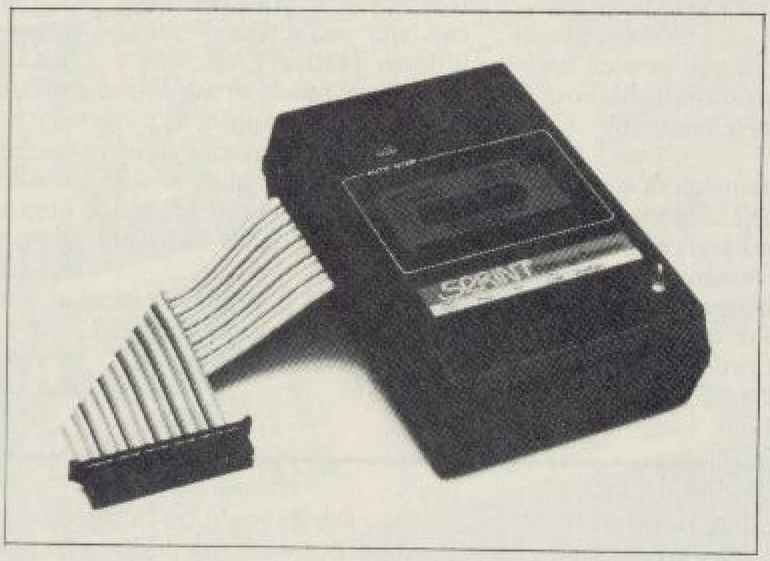
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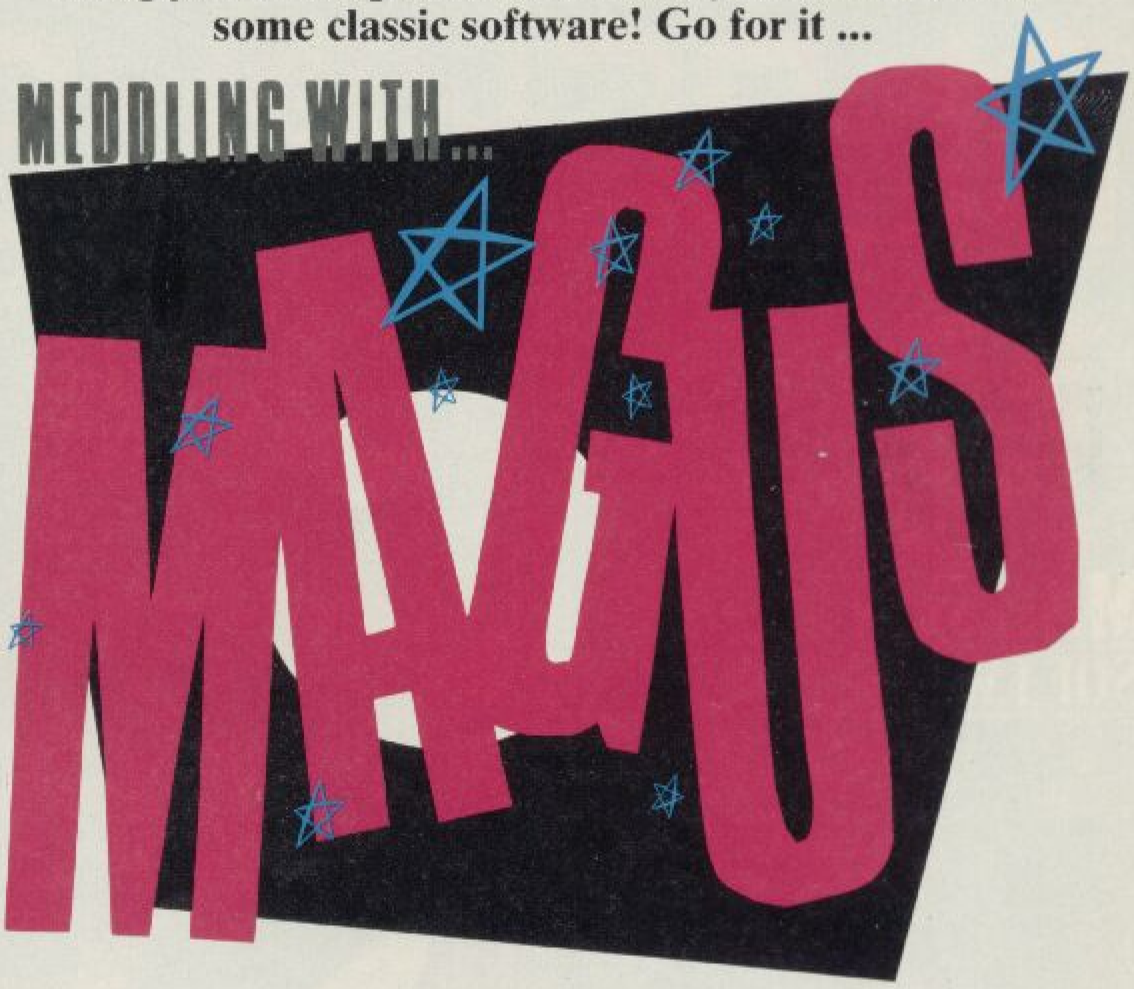
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The Gamelords of *Quicksilva* have got together with the cringing creatures from the *YS* Towerblock to bring you a competition in which you stand to win some classic software! Go for it ...



All you'll need to enter this month's magic competition is a copy of Quicksilva's latest mysterious arcade adventure — Mighty Magus! Then, if you can answer four simple questions about the game, you're in with a pretty good chance of taking home a lot more great software from Quicksilva. What a wizard game!

THE PLOT

In the game, you get to play the part of the old wizard, known throughout the land as the Mighty Magus, and it's your final task to destroy your old adversary — the giant dragon that lurks at the bottom of the Rising Sun Temple (Sounds like a Chinese take-away to me! Ed.). Unfortunately, you haven't just got the dragon to contend with — no such luck! And, if it weren't a question in the compo, we'd be happy to depress you with blood-curdling descriptions of all the other nasties in the labyrinth!

So, that's the last you've heard from us about the game. You'll just have to play it yourselves if you're going to be able to answer the following questions:

1. How many levels must you go through in order to reach the dragon?
2. Which level does not exist?
3. What other dangerous creature inhabits the dragon level?
4. Name or describe three other inhabitants of the Rising Sun Temple?

THE BOOTY

If you're one of those people that don't enter competitions because you don't reckon your chances of coming away with a prize, then keep reading! The first prize and runners-up awards might not be a mega-huge, but there are lots of them — which gives you much more of a chance of winning!

Quicksilva is stumping up 25 first prizes of any three of five of its classic games — Zombie Zombie, Battlezone, Strontium Dog — The Killing, Gatecrasher and Fantastic Voyage! And, for the 50 runners-up, there's your choice of one of the five games ...

Send all your entry coupons to Quicksilva Competition, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

QUICKSILVA RULES OK!

- *Entries for the Quicksilva Competition must be post-dated no later than April 30th, 1985.*
- *Each entry form must have the answers to the four questions and your selection of the three Quicksilva games you'll want if you win (plus an indication of your favourite should you be a runner-up).*
- *The Editor's decision is final and no correspondence will be entered into regarding this decision.*

QUICKSILVA COMPETITION

Having cracked Quicksilva's *Mighty Magus* and battled the dragon to submission, these questions seem ridiculously easy! However, for the chance of nobbling some free software, here are my answers:

1. ....
2. ....
3. ....
4. A ....
B ....
C ....

I've put a cross beside my three favourite games, and I've underlined the one game I want should Quicksilva be mean enough to make me a mere runner-up!

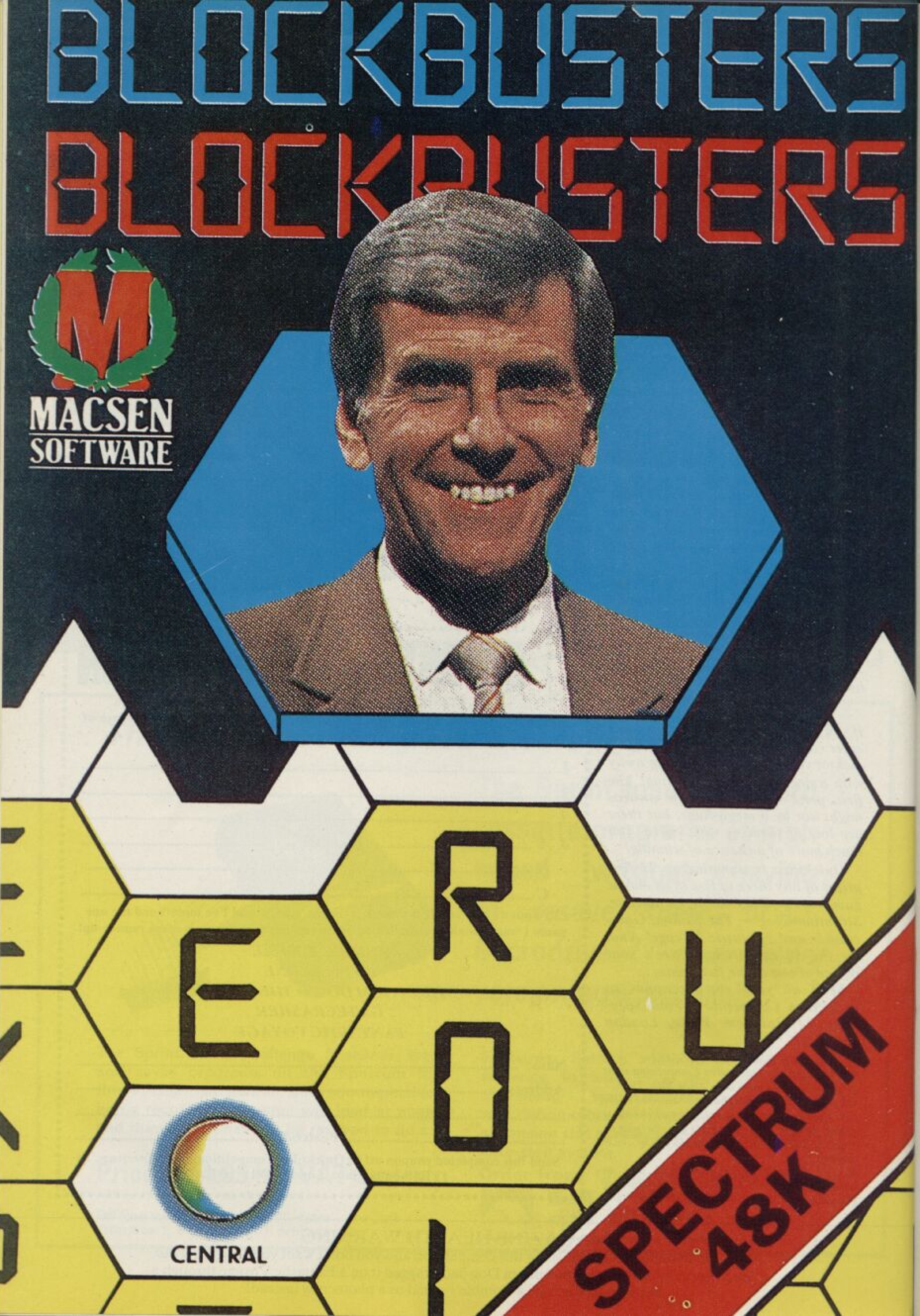
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MAGAZINE HEALTH WARNING

If you're thinking of Gatecrashing this competition and you don't want your copy of *Your Spectrum* to look as though Strontium Dog had dragged it on a Fantastic Voyage through a Battlezone, don't be a Zombie — send us a photocopy instead!


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SCREEN SCRUNGER

Calling all those of you who are contemplating adding graphics to your adventure programs. Chris Wood has devised a couple of screen compressor programs that'll 'scrunge' those screens and save those precious bytes.

What we're talking about here is a two-in-one 'screen scrunger' — or screen compressor, if you prefer — that's fast, relocatable and short (less that 50 bytes each!). Using either of these routines, or a combination of both, you can 'scrunge' most screens down to at least half their original size and, with a built-in relocatable screen scrunger saved as standard with each picture, you can have between 10 and 15 screens stored in memory at any one time!

Adventure writers only require the top third or so of each screen saved, which is why the program included does this . . . and even lets you move bits of the screen around. The only restriction on saving parts of the screen is that attributes have to be compressed separately; this is because the program can only handle continuous chunks of memory.

ON-SCREEN STORAGE

At this stage, there's no need to go into too much detail about how the Spectrum's screen is laid out — but if you've got a couple days spare sometime . . . Suffice to say that what you see on-screen is no more than an area of memory that we can see and, as far as the Spectrum's concerned, it's nothing but a jumble of binary figures.

In the meantine, here's some information on how the scrunger routines work . . . and why you need two of them! Take a look at a few SCREEN$ pictures and you'll see there are quite a few large areas of the same colour — from which you'd summise that the same value is popping up in memory quite often. You'd be right!

Thus, our first routine dives through the screen memory counting the number of times a particular value pops up until a different value is found. Once another value has been found, the Spectrum resets its internal counter, stores the data

```
  10 POKE 23658,8
```

Line 10 Turns the Caps Lock feature on.

```
  20 PAPER 7: INK 0: CLS
  30 PRINT "  HOW MUCH DO YOU WA
NT SAVED?"
  40 PRINT ''" 1. PART OF SCREEN
$ "''" 2. ALL OF SCREEN$ "
  50 IF INKEY$="2" THEN  POKE 30
009,64: POKE 30048,91: POKE 3005
6,64: POKE 30065,91: POKE 40010,
64: POKE 40046,91: POKE 40054,64
: POKE 40063,91: GO TO 500
  60 IF INKEY$<>"1" THEN  GO TO
50
  70 CLS : PRINT ''"  INPUT LIMI
TS"
  80 PRINT ''"64.TOP OF INK"''"7
2.MIDDLE OF INK"''"80.BOTTOM OF
INK"''"88.TOP OF ATTRIBUTES"''"8
9.MIDDLE OF ATTRIBUTES"''"90.BOT
TOM OF ATTRIBUTES"''"91.END OF S
CREEN"
  90 INPUT "FROM? ";START: INPUT
 "END? ";END
  95 POKE 30009,START: POKE 4001
0,START: POKE 30048,END: POKE 40
046,END
 100 INPUT "PARTS TO GO TO SAME
PLACE?";A$: IF CODE A$=CODE "Y"
THEN  GO TO 110
 105 INPUT "TO GO TO? ";DEST
 106 LET DIFF=DEST-START: LET EN
D=END+DIFF: LET START=START+DIFF
 110 POKE 30056,START: POKE 4005
4,START: POKE 30065,END: POKE 40
063,END
```

Lines 20-110 Provide the menu options for the screen scrunger.

```
 500 GO SUB 990: LET L=USR 30000
: LET M=USR 40000: LET L=L-30054
: LET M=M-40052
 510 CLS : PRINT "EXTRACTING 0 A
ND 255 TAKES "; PAPER 6;L''; PAP
ER 7;"SQUASHING ALL DATA TAKES "
; PAPER 6;M
```

Lines 500-510 Find out how much space is saved by each routine, and then print up each option.

```
 520 PRINT ''"SAVE FIRST OR SECO
ND?"
 530 INPUT "SAVE? (1 OR 2)?";A
 540 IF A=1 THEN  CLS : RANDOMIZ
E USR 30054: SAVE "SQUASHED SCRE
EN$ "CODE 30054,L: RUN
 550 IF A=2 THEN  CLS : RANDOMIZ
E USR 40052: SAVE "SQUASHED SCRE
EN$ "CODE 40052,M: RUN
 560 GO TO 530
```

Lines 520-560 Save the 'scrunged' screen.

```
 990 POKE 65370,64: POKE 65373,1
96: RANDOMIZE USR 65368: RETURN
 995 POKE 65370,196: POKE 65373,
64: RANDOMIZE USR 65368: RETURN
 999 STOP
```

Lines 990-999 Contain the screen handling subroutines.

```
1000 RESTORE 1010: LET CH=0: FOR
 N=0 TO 81: READ A: LET CH=CH+A:
 POKE 40000+N,A: POKE 49000+N,A:
 NEXT N
1001 IF CH<>8217 THEN  PRINT "ER
ROR IN DATA IN LINE 1010": STOP
1005 LET CH=0: FOR N=0 TO 97: RE
AD A: LET CH=CH+A: POKE 30000+N,
A: POKE 39000+N,A: NEXT N
1006 IF CH<>9171 THEN  PRINT "ER
ROR IN DATA IN LINE 1020": STOP
1008 FOR N=65368 TO 65379: READ
A: POKE N,A: NEXT N: CLEAR 29999
: PRINT "LOADING": LOAD ""SCREEN
$ : GO SUB 995: GO TO 1
```

Lines 1000-1008 Provide the initialisation routines.

```
1009 REM SQUASH ALL CODE
1010 DATA 197,209,33,85,0,25,235
,221,33,0,64,14,1,221,126,0,221,
190,1,32,8,121,60,167,40,3,79,24
,10,221,126,0,18,19,121,18,19,14
,1,221,35,221,229,225,124,254,91
,32,220,213,193,201,17,0,64,221,
33,33,0,221,9,122,254,91,200,221
,70,1,221,126,0,18,19,16,252,221
,35,221,35,24,236,0
```

Lines 1009-1010 Contain the data for the first screen scrunger routine.

```
1019 REM EXTRACT 0 AND 255 CODE
1020 DATA 197,209,33,100,0,25,23
5,33,0,64,14,1,126,167,40,9,254,
255,40,5,237,160,3,24,21,71,121,
60,35,40,7,126,184,32,3,12,24,24
3,120,18,19,121,18,19,14,1,124,2
54,91,32,217,213,193,201,17,0,64
,221,33,46,0,221,9,122,254,91,20
0,221,126,0,167,40,10,254,255,40
,6,18,19,221,35,24,236,221,70,1,
18,19,16,252,221,35,221,35,24,22
3,0,0
```

Lines 1019-1020 Contain the data for the second screen scrunger routine.

```
1030 DATA 17,0,176,33,0,64,1,0,2
7,237,176,201
```

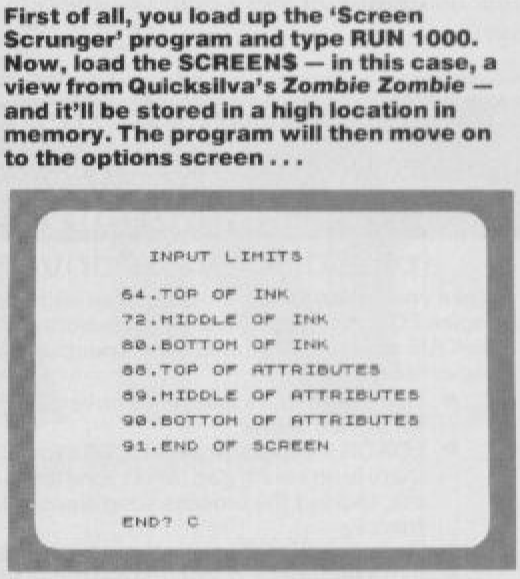
Lines 1029-1030 Provide the save routine for the SCREEN$.

The 'screen scrunger' program should be initialised with 'RUN 1000' to set up the data in lines 1009-1020. Once the data has been initialised, the program flow is directed to the menu of options offered by the scrunger.

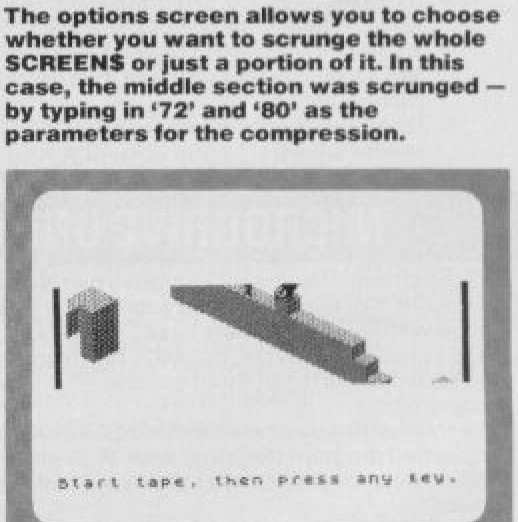
SQUEEZE ME!



First of all, you load up the 'Screen Scrunger' program and type RUN 1000. Now, load the SCREEN$ — in this case, a view from Quicksilva's *Zombie Zombie* — and it'll be stored in a high location in memory. The program will then move on to the options screen . . .



The options screen allows you to choose whether you want to scrunge the whole SCREEN$ or just a portion of it. In this case, the middle section was scrunged — by typing in '72' and '80' as the parameters for the compression.



The program offers you the option of saving the compressed SCREEN$ code — displaying the relevant section on-screen whilst saving takes place. The 'Screen Scrunger' itself will advise you as to which routine is the most efficient for the SCREEN$ you're scrunging.

SCREEN SCRUNGER

and carries on looking through the rest of the screen memory. For example, the following data '1,1,1,1,1,1,2,2,2,2,3,3,3,3' in screen memory would be scrunged and stored as '1*6,2*4,3*4'.

As the routine allocates a single byte to store the internal counter, if there's more than 256 occurances of the same value the counter resets itself and the next value is treated anew. For example, a row of 400 twos becomes '2*0,2*144' (where a zero value denotes '256').

FOR MY NEXT TRICK . . .

The first routine will suit most screen-scrunging requirements, but very complex screens with few repeated values can trip the routine up. For example, a block of memory that originally looks like '1,2,3,4' becomes '1*1,2*1,3*1,4*1', and four bytes is transformed into eight — not a good method if complex illustrations, such as the start-up screen in *Lunar Jetman*, can grow to around 7.5K instead of the usual 6.5K!

And this is where the second routine comes in. Complex visual screens, such as Ultimate's, require a routine that just takes all the free bytes (that is, all the zeros in the background) and just squashes all the rest of the data up. Using this method, you can't help but make a saving.

However, to make the second routine even more clever, it's also programmed to take out the 255s that occur in solidly-filled blocks of the screen. You'll be glad to know that the *Lunar Jetman* screen mentioned earlier is scrunged happily down to around 4.5K!

But don't start worrying which routines you're going to have to use with each screen, as the Basic program (the two routines are provided in the data statements) tells you which 'scrunger' is the most efficient for each case.

To make use of the 'scrunged' screens saved by the program, call the machine code from the same address at which you load the code; each picture saved is accompanied by a screen decompressor routine at its start. For example, if you want to put your 'scrunged' screen at address 40000, you'd get it back on-screen by executing 'RANDOMISE USR 40000'. Happy scrunging, my dear-ios! YS



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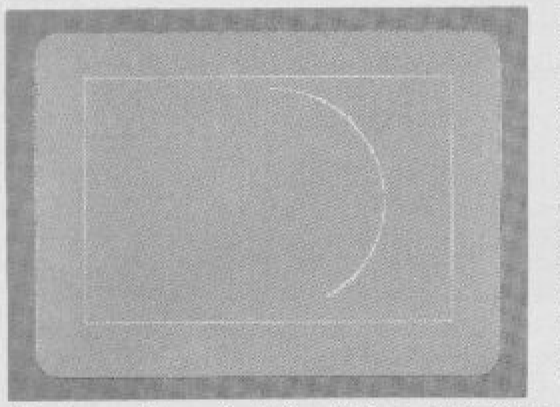
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PROGRAM POWER

Here's a double helping of listings to satisfy your appetite for good Spectrum programming, courtesy of **Colin Barnsley** *and* **Peter Simmons**. *All programming contributions should be sent to Gavin Monk, Program Power,* **Your Spectrum**, *14 Rathbone Place, London W1P 1DE.*

SQUIRLER

BY COLIN BARNSLEY



With shades of the *Spirograph* designing tool, this program allows you to create some fine technically accurate graphics ... and some pretty ones too! Try some of the example inputs we've given you and then experiment with them. Practise makes perfect, as they say!

Hands up all you budding Dalis and Da Vincis who, having spent hours with the latest graphics packages, stand back from that flickering screen, wiping bloodshot eyes, only to come to the conclusion that you should have stuck to textual programs? And how about those tasks the Art tutor used to set using a piece of string and an eccentric cog that just didn't seem to, well ... work?

Well, here's a nifty little program that'll create amazing graphics for you — all it requires from you is a few numbers!

The Squirler makes use of the INKEY$ command, and the current state of the variables are displayed in the menu; INKEY$ is used because, although it takes you longer to type this listing into the Speccy, the time taken to execute the program is reduced considerably. Another point to note is that the Spectrum calculates its angles in radians and the program stores it as such — however, as radians aren't the easiest quantities to work with, all the angles are displayed in degrees.

When you RUN the program, you'll be presented with a menu on-screen; take a look at the options you're offered in the table given. Once you've entered some figures, the program determines how many arcs it's going to need to draw before your masterpiece is completed. Then, once all the values have been written into temporary variables for manipulation (without destroying their original values), plotting begins on-screen. On a final note, if you choose a variable that results in the Spectrum kicking back with an 'integer out of range' error message, you'll have to start the program up again with 'GO TO 20'.

Do persevere with the program — it's not too long to type in, but some may find it a bit tricky to end up with a decent drawing first time out. Have a look at the sample inputs given ... and then experiment a little. You'll probably find you create your best designs by accident — but that's life!

OPTION	ACTION
start	The position on the circumference of an imaginary circle from which the very first arc is drawn; for example, '0' starts at the top, '270' at 9 o'clock, and so on.
degree swing	The number of degrees turned through — from the imaginary centre (x,y) of a circle — in one arc; thus, '60' gives a six-pointed shape, '72' a five-pointed shape, and so on.
x,y position	This gives the imaginary position of the centre of a shape in pixels; the co-ordinates of the screen centre is about (128,87).
plots	The number of full drawings that'll be completed in the final design.
x,y slide	The number of pixels to be added or subtracted from the imaginary centre after each complete drawing.
circle radius	The pixel radius of an imaginary circle in which the shape is drawn.
circle squash	The percentage reduction in size (per full drawing of the shape) of the imaginary circle's radius; thus, a 'cir squash' of '5' reduces the full drawing of the shape by five per cent.
bend	The number of degrees through which the direction is changed in one arc of a 'degree swing'.
bend add	The constant number of degrees to add (for each complete drawing of the shape) to accomplish the required 'bend'.
degree revolution	The number of degrees of turn needed to end up at the starting point; thus, when n>1, 'cir squash' and 'bend' gives a spiral effect.
plot	Draws the final design.

SQUIRLER EXAMPLE INPUTS

	CIRCLE RADIUS	START	DEGREE SWING	PLOT NUMBER	BEND	DEGREE REVOLUTION	CIRCLE SQUASH	BEND ADD	X POSITION	X SLIDE	Y POSITION	Y SLIDE
Whirling Galaxies	80	0	72	30	60	3	3	3	128	0	87	0
Devil Helmet	80	0	180	36	40	5	0	0	90	2	87	0
Flowers	80	0	20	5	300	0	10	-2	128	0	87	0
Limpet Shell	80	0	40	30	50	4	5	0	90	2.5	87	0.5

```
  1 REM  Written by Colin          Barnsley
   in a flurry of     inspiration...
 10 LET s=0: LET ys=0: LET xs=0: LET d=0: LET cq=0: LET ba=0: LET cr=80: LET bri=0: LET b=0: LET n=0: LET x1=128: LET y1=87: LET t=0
```

Line 10 Initialises the variables used in the program.

```
 20 LET z=360: BRIGHT bri: CLS : PRINT AT 0,9;"THE SQUIRLER": PRINT : PRINT
 30 PRINT "i...ink+paper";TAB 15;"z...toggle bright": PRINT "s...start";TAB 15;"d...deg swing"
 40 PRINT "x...x posn";TAB 15;"X...x slide": PRINT "y...y posn";TAB 15;"Y...slide"
 50 PRINT "q...cir squash";TAB 15;"a...bend add"
 60 PRINT "c...cir radius";TAB 15;"b...bend": PRINT "n...no. plots";TAB 15;"r...deg rev'n": PRINT "p...plot"
 70 PRINT AT 13,15;"x = ";x1;TAB 23;"xsd = ";xs
 80 PRINT AT 14,15;"y = ";y1;TAB 23;"ysd = ";ys
 90 PRINT AT 13,0;"circ = ";cr: PRINT "start = ";s: PRINT "deg = ";d: PRINT "n = ";n
100 PRINT "bend = ";b*180/PI: PRINT "rev = ";t: PRINT "circ squash = ";cq: PRINT "bend add = ";ba
```

Lines 20-100 Display the various menu options available (see the Options table) and the current state of the variables. Note that the variable 'b' displays the angles in degrees, although the program itself stores this quantity in radians.

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Halls of Things	Crystal	7.50	6.75
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OFM Database	Dialogue	14.95	13.00
Fighter Pilot	Digital Integration	7.95	7.15
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Maziacs	DK Tronics	6.95	6.25
Meteroids	DK Tronics	4.95	4.50
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Speed Duel	DK Tronics	5.95	5.35
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Eureka	Domark	14.95	13.50
Oracles Cave	Doric	7.95	7.15
Dungeon Builder	Dream	9.95	8.95
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Harrier Attack	Durell	5.95	5.35
Jungle Trouble	Durell	5.95	5.35
Scuba Dive	Durell	5.95	5.35
Kokotoni Wilf	Elite	5.95	5.35
Beaky & Egg Snatch	Fantasy	5.50	4.95
Doomsday Castle	Fantasy	6.50	5.85
The Pyramid	Fantasy	5.50	4.95
Skull	Games M/C	6.95	6.25
Ad Astra	Gargoyle	5.95	5.35
Ta Na Nog	Gargoyle	9.95	8.95
The Quill	Gilsoft	14.95	13.00
Eye of Ehdolan	Gilsoft	9.95	8.95
Monty Mole	Gremlin Graphics	5.95	5.35
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Heathrow	Hewson Consultants	7.95	7.15
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3D Seiddab Attack	Hewson Consultants	7.95	7.15
3D Space Wars	Hewson Consultants	5.95	5.35
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Pedro	Imagine	5.50	4.50
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Zzoom	Imagine	5.50	4.95
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Millionaire	Incentive	5.50	4.95
Mountains of Ket	Incentive	5.50	4.95
Splat!	Incentive	5.50	4.95
Temple of Vran	Incentive	5.50	4.95
1984	Incentive	5.50	4.95
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Tiler	Interceptor	5.50	4.95
Defenda	Interstella	5.95	5.35
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Paras	Lothlorien	6.95	6.25
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Hurg	Melbourne House	14.95	13.00
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Melbourne Draw	Melbourne House	8.95	8.00
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Spec Mac Man	Oasis	14.95	13.00
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Daley Thompson's Decathlon	Ocean	6.90	6.20
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Eskimo Eddie	Ocean	5.90	5.30
Gilligans Gold	Ocean	5.95	5.35
Hunchback	Ocean	6.90	6.20
Kong	Ocean	5.90	5.30
Moon Alert	Ocean	5.90	5.30
Mr Wimpy	Ocean	5.90	5.30
Pogo	Ocean	5.90	5.30
Royal Birkdale	Ocean	5.90	5.30
The Forest	Phipps	9.95	8.95
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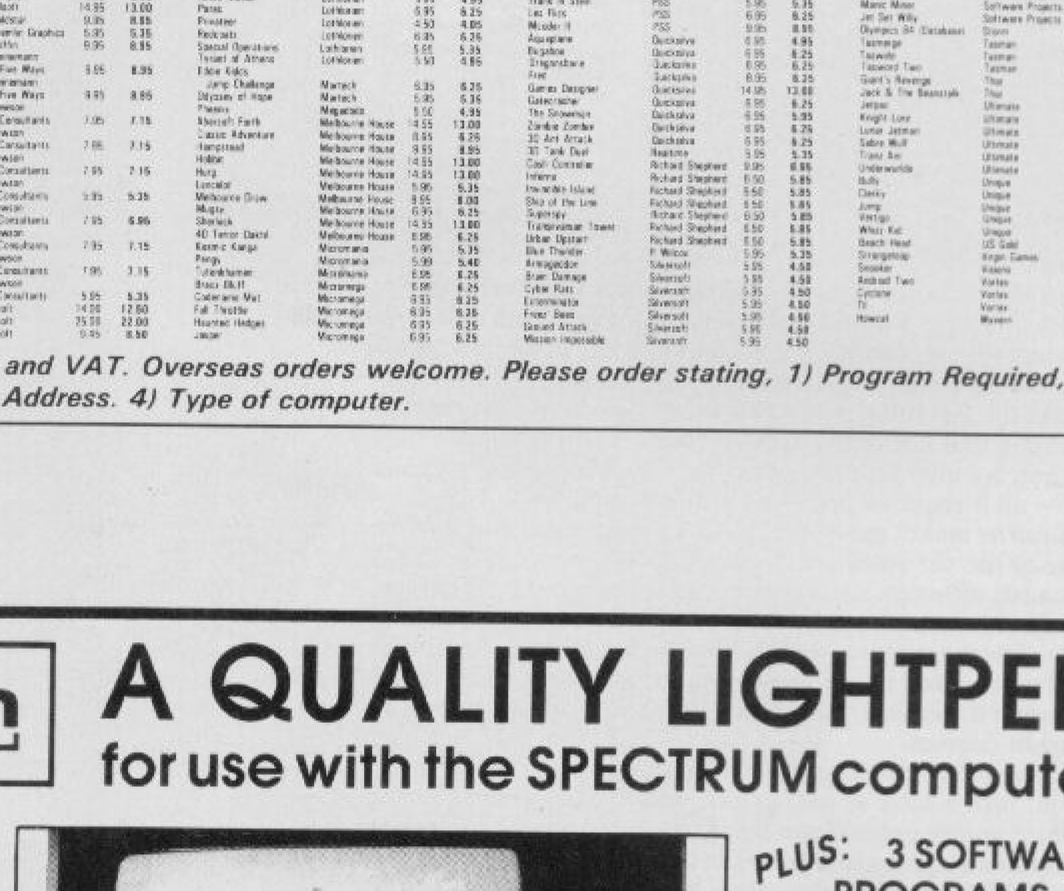
Title	Company	R.R.P.	Ours
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Robot Riot	Silversoft	5.95	4.50
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Learn to Read 2	S/Macmillan	9.95	8.95
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or ask at your local computer shop. Send S.A.E. for details. Lightpens and software are also available for BBC B, Dragon, CBM-64 and VIC-20.

```
105 PRINT £1;"Press key for option"
110 LET h$=INKEY$: IF h$="" THEN GO TO 110
120 IF h$="i" THEN INPUT "ink ";i: INPUT "p
aper ";p: PAPER p: BORDER p: INK i: GO TO 20
130 IF h$="z" THEN LET bri=NOT bri: GO TO 2
0
140 IF h$="s" THEN INPUT "start ";s: GO TO
20
150 IF h$="d" THEN INPUT "deg ";d: GO TO 20
160 IF h$="x" THEN INPUT "x posn ";x1: GO T
O 20
170 IF h$="X" THEN INPUT "x slide ";xs: GO
TO 20
180 IF h$="y" THEN INPUT "y posn ";y1: GO T
O 20
190 IF h$="Y" THEN INPUT "y slide ";ys: GO
TO 20
200 IF h$="q" THEN INPUT "circ squash ";cq:
GO TO 20
210 IF h$="a" THEN INPUT "bend add ";ba: GO
TO 20
220 IF h$="c" THEN INPUT "circ radius ";cr:
GO TO 20
230 IF h$="b" THEN INPUT "bend ";b: LET b=b
/180*PI: GO TO 20
240 IF h$="n" THEN INPUT "n ";n: GO TO 20
250 IF h$="r" THEN INPUT "rev ";t: GO TO 20
260 IF h$="p" THEN GO TO 300
270 GO TO 110
```

Lines 105-270 Update the variables as the program is RUN.

```
300 IF d=0 OR n=0 THEN GO TO 20
310 LET w=z/d: IF INT w=w THEN GO TO 350
320 LET z=z+360: IF z>7200 THEN GO TO 20
330 GO TO 310
```

Lines 300-330 Determine the number of arcs per full plot of the shape.

```
350 LET csq=cq/100: LET x=x1: LET y=y1: LET
cir=cr: LET bd=b
```

Line 350 Moves the parameter values to the temporary variable set.

```
360 CLS : GO SUB 600
370 FOR r=0 TO n-1: FOR a=0 TO w-1
380 LET rad=(r*t+a*d+s)/180*PI: LET rad2=(r*
t+(a+1)*d+s)/180*PI
'390 LET sin=(SIN rad)*cir: LET sin2=(SIN rad
2)*cir
400 LET cos=(COS rad)*cir: LET cos2=(COS rad
2)*cir
410 PLOT x+sin,y+cos: DRAW sin2-sin,cos2-cos
,bd
```

Lines 360-410 Begin the plotting on-screen. Calculations are made to find the value in radians that the shape should be turned through for the start and end of the swing, and a line is drawn between the points.

```
420 IF INKEY$<>"" THEN GO TO 500
```

Line 420 Checks for the 'exit' routine. If a call has been made to go to the 'exit' routine, the program flow is resumed at line 500.

```
430 NEXT a: LET x=x+xs: LET y=y+ys: LET cir=
cir*(1-csq): LET bd=bd+ba/180*PI
```

Line 430 Adjusts the slides and squashes once the shape has been plotted.

```
440 NEXT r: PRINT AT 21,0;"Menu (m) lprint (
1)"
450 LET h$=INKEY$: IF h$="m" THEN GO TO 20
460 IF h$="l" THEN PRINT AT 21,0;"
         ": GO SUB 600: COPY : GO TO 440
470 GO TO 450
```

Lines 440-470 When you've finished creating your design on-screen, you're given the option to either re-draw the BORDER or COPY.

```
500 PRINT AT 21,0;"Menu (m) cont (c) lprint
(1)"
510 LET h$=INKEY$: IF h$="m" THEN GO TO 20
520 IF h$="c" THEN PRINT AT 21,0;"
                 ": GO SUB 600: GO TO 38
0
530 IF h$="1" THEN PRINT AT 21,0;"
                 ": GO SUB 600: COPY : GO
TO 500
540 GO TO 500
```

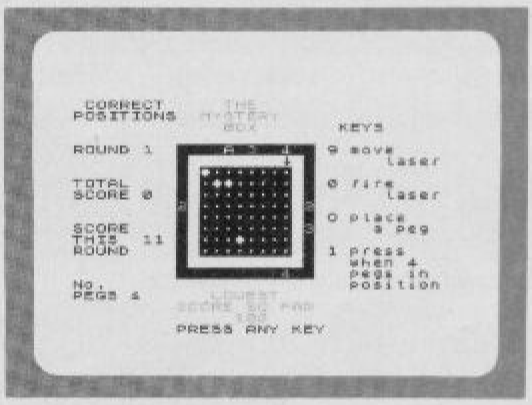
Lines 500-540 The 'exit' routine.

```
600 PLOT 0,0: DRAW 255,0: DRAW 0,175: DRAW -
255,0: DRAW 0,-175: RETURN
```

Line 600 The 'BORDER draw' routine.

MYSTERY BOX

BY PETER SIMMONS



***Mystery Box* is a very complex game but, once you've grasped the principles, you won't be able to pull the plug. Simply move the arrow around the outside of the grid, fire the laser and watch carefully. You'll soon get the hang of it.**

If you're a guru of logical deduction, then you'll have probably played this game before; it's better known as *Blackbox*. If such pastimes have managed to elude you then settle down for your first lesson in cultural awareness!

Mystery Box is one of those games that takes quite a while to get the grip of but, once mastered, is highly compulsive. The basic idea behind the game is that you can shoot lasers into the box and, by carefully noting where they reappear, you have to deduce the position of the pegs in the box. A laser can either bounce off the corner of a peg, be reflected back to the same position it started from or be totally absorbed in a head-on collision.

The aim of this highly complex game is to find the pegs in the fewest number of laser shots. In the *YS* office this game kept us going for quite a while and we managed to get the score down to 96 over the five rounds you have to play.

You can choose whether the Speccy will hide four or five pegs ... and, from our experience, beginners would be best to start on the four peg option. And, now, on to the play itself ...

You move the laser around the outside of the box on-screen using the '9' key; when you want to fire the laser, press the zero key. If you think you've found one of the pegs, press the '0' key and use the cursor controls to guide a graphics question mark around the screen until it's flashing over the position you think the peg is in. Once positioned, press the 'P' key and the marker will be placed. If, at any time, you think you've made an error in your judgement, you place the peg by the same process, but this time press the 'U' key to remove the marker.

When you think you've got all the hidden pegs out in the open, press the '1' key and the computer will tell you if you got them all in the right position and update your score.

Once you've completed all five rounds, the Spectrum will report your overall score and ask if you'd like to indulge in another game. Press the 'Y' key if you're feeling brave ...

```
 1 REM THE MYSTERY BOX
 2 REM Peter J Simmons
10 FOR f=0 TO 47: READ a: POKE USR "A"+f,a:
NEXT f
20 DATA 0,0,0,24,24,0,0,0,0,24,60,126,126,6
0,24,0,0,16,56,84,16,16,16,0,0,8,8,8,42,28,8,
0,0,0,8,4,126,4,8,0,0,16,32,126,32,16,0,0
```

Lines 1-20 Set up the user-defined graphics.

```
25 LET ls=100
30 LET a=6: LET b=11: LET b$="d"
40 PAPER 7: INK 0: BORDER 7: FLASH 0: OVER
0: CLS
50 DIM x(5): DIM y(5)
55 GO SUB 2200
```

Lines 25-55 Initialise the variables and screen attributes. Line 55 calls the 'instruction' subroutine.

```
 60 LET r=0: LET ts=0: LET sc=0
 80 CLS : GO SUB 2000
```

Lines 60-80 Set up the 'round number' and score variables, and then call the subroutine to print the score and controls.

```
 90 FOR f=5 TO 16 STEP 11: PRINT  PAPER 0;AT
f,9;"            ": NEXT f: PRINT AT 6,9;"■
        ■";AT 15,9;"■        ■"
 100 FOR f=7 TO 14: PRINT  PAPER 0; INK 7;AT
f,9;" ■aaaaaaaa■ ": NEXT f
 110 PRINT  FLASH 1; INK 0;AT a,b;b$
```

Lines 90-110 Draw the game 'box'.

```
 120 GO SUB 1000: REM Pick random positions
 125 LET def=-1
```

Lines 120-125 Call the subroutine to position the pegs randomly in the box.

```
 130 IF INKEY$="o" THEN  GO SUB 2080: GO SUB
900
 135 IF INKEY$="1" THEN  GO TO 1400
 140 IF INKEY$="0" THEN  BEEP 0.05,25: GO TO
250
 150 IF INKEY$<>"9" THEN  GO TO 130
```

Lines 130-150 Read the keyboard and act upon any keypresses.

```
 155 PRINT AT a,b;" "
 160 IF a=6 THEN  LET b=b+1: LET b$="d"
 170 IF b=19 THEN  LET a=a+1: LET b$="f"
 180 IF a=15 THEN  LET b=b-1: LET b$="c"
 190 IF b=10 THEN  LET a=a-1: LET b$="e"
 195 IF a=6 AND b=10 THEN  LET b=b+1: LET b$=
"d"
 200 PRINT  FLASH 1; INK 0;AT a,b;b$: BEEP 0.
05,-40
 210 GO TO 140
```

Lines 155-210 Move the laser around the box.

```
 255 LET a1=0: LET r1=0: LET n1=0: LET s1=0:
LET e1=0: LET w1=0:: LET z=0: LET p=a: LET q=
b: LET j=p: LET k=q
 260 IF a=6 THEN  GO TO 300
 270 IF b=19 THEN  GO TO 400
 280 IF a=15 THEN  GO TO 500
 290 IF b=10 THEN  GO TO 600
```

Lines 255-290 Fire the laser. Lines 260-290 call routines to check the movement of the shots.

```
 300 LET j=j-1: LET c=6
 310 FOR f=1 TO np
 315 IF c+1<>y(f) THEN  GO TO 375
 320 IF b=x(f) THEN  GO TO 1100
 330 IF c=6 AND (x(f)+1=b OR x(f)-1=b) THEN
LET r1=1
 345 IF b-1=x(f) THEN  LET e1=1
 350 IF b+1=x(f) THEN  LET w1=1
 375 IF f=np AND r1=1 THEN  GO TO 1200
 380 NEXT f
 382 IF e1 OR w1 THEN  GO TO 800
 385 LET c=c+1: IF c<14 THEN  GO TO 310
 390 LET s1=1: LET def=def+1: GO TO 1300
```

Lines 300-390 Check the movement of each laser shot, fired from the top of the box.

```
 400 LET k=20: LET c=19
 410 FOR f=1 TO np
 415 IF c-1<>x(f) THEN  GO TO 475
 420 IF a=y(f) THEN  GO TO 1100
 430 IF c=19 AND (y(f)+1=a OR y(f)-1=a) THEN
LET r1=1
 445 IF a-1=y(f) THEN  LET s1=1
 450 IF a+1=y(f) THEN  LET n1=1
 475 IF f=np AND r1=1 THEN  GO TO 1200
 480 NEXT f
 482 IF n1 OR s1 THEN  GO TO 800
 485 LET c=c-1: IF c>11 THEN  GO TO 410
 490 LET w1=1: LET def=def+1: GO TO 1300
```

Lines 400-490 Check the movement of each laser shot, fired from the right of the box.

```
 500 LET j=16: LET c=15
 510 FOR f=1 TO np
 515 IF c-1<>y(f) THEN  GO TO 575
 520 IF b=x(f) THEN  GO TO 1100
 530 IF c=15 AND (x(f)+1=b OR x(f)-1=b) THEN
LET r1=1
 545 IF b+1=x(f) THEN  LET w1=1
 550 IF b-1=x(f) THEN  LET e1=1
 575 IF f=np AND r1=1 THEN  GO TO 1200
 580 NEXT f
 590 LET n1=1: LET def=def+1: GO TO 1300
```

Lines 500-590 Check the movement of each laser shot, fired from the bottom of the box.

```
 600 LET k=9: LET c=10
 610 FOR f=1 TO np
 615 IF c+1<>x(f) THEN  GO TO 675
 620 IF a=y(f) THEN  GO TO 1100
 630 IF c=10 AND (y(f)+1=a OR y(f)-1=a) THEN
LET r1=1
 645 IF a+1=y(f) THEN  LET n1=1
 650 IF a-1=y(f) THEN  LET s1=1
 675 IF f=np AND r1=1 THEN  GO TO 1200
 680 NEXT f
 682 IF n1 OR s1 THEN  GO TO 800
 685 LET c=c+1: IF c<18 THEN  GO TO 610
 690 LET e1=1: LET def=def+1: GO TO 1300
```

Lines 600-690 Check the movement of each laser shot, fired from the left of the box.

```
 810 IF (w1 AND e1) OR (n1 AND s1) THEN  GO T
O 1200
 820 IF w1 THEN  LET a=c: LET c=b: LET w1=0:
GO TO 410
 830 IF s1 THEN  LET b=c: LET c=a: LET s1=0:
GO TO 310
 840 IF n1 THEN  LET b=c: LET c=a: LET n1=0:
GO TO 510
 850 IF e1=1 THEN  LET a=c: LET c=b: LET e1=0
: GO TO 610
```

Lines 810-850 Swop the values of variables 'b' and 'c'. Variables 'wl', 'sl', 'nl' and 'el' represent directions West, South, North and East in relation to the box.

```
 900 LET u=7: LET v=11
 905 LET a$="a"
 907 IF ATTR (u,v)=48 THEN  LET a$="b"
 910 PRINT AT u,v;a$
 915 LET c$=INKEY$: IF c$="" THEN  GO TO 950
 920 IF c$="5" AND v>11 THEN  LET v=v-1
 930 IF c$="6" AND u<14 THEN  LET u=u+1
 935 IF c$="7" AND u>7 THEN  LET u=u-1
 940 IF c$="8" AND v<18 THEN  LET v=v+1
 945 LET a$="a"
 947 IF ATTR (u,v)=48 THEN  LET a$="b"
 950 PRINT AT u,v;"?"
 955 BEEP 0.01,20
 960 IF INKEY$="i" THEN  PRINT AT u,v;a$: GO
SUB 2060: RETURN
 970 IF INKEY$="p" THEN  PRINT ;AT u,v;"b": G
O SUB 2060: RETURN
 980 IF INKEY$="u" THEN  PRINT AT u,v;"a": GO
SUB 2060: RETURN
 990 GO TO 910
```

Lines 900-990 Position a peg in the box, by moving a flashing question mark '?' around the screen using the cursor control keys. Looking at lines 960-980, key 'I' returns you to the game screen, key 'P' positions a peg on-screen, and key 'U' removes a peg.

```
1000 FOR f=1 TO np
1010 LET x(f)=INT (RND*8)+11: LET y(f)=INT (R
ND*8)+7
1020 IF f=1 THEN  GO TO 1050
1030 FOR n=1 TO f-1: IF x(f)=x(n) AND y(f)=y(
n) THEN  GO TO 1010
1040 NEXT n
1050 NEXT f
1070 RETURN
```

Lines 1000-1070 Set the peg positions in the box. Line 1030 checks to make sure that two pegs don't occupy the same place.

```
1110 PRINT AT j,k; INK 7; PAPER 0;"A"
1140 LET sc=sc+1: PRINT AT 13,6;sc: LET a=p:
LET b=q: GO TO 130
1210 PRINT AT j,k; INK 7; PAPER 0;"R"
1230 LET sc=sc+1: PRINT AT 13,6;sc: LET a=p:
LET b=q: GO TO 130
1300 IF def>9 THEN  LET def=9
1310 PRINT  PAPER 0; INK 6;AT j,k;def
1320 IF w1 OR e1 THEN  PRINT  PAPER 0; INK 6;
AT a,(9*w1)+(20*e1);def
1330 IF n1 OR s1 THEN  PRINT  PAPER 0; INK 6;
AT (5*n1)+(16*s1),b;def
1340 LET sc=sc+2: PRINT AT 13,6;sc: LET a=p:
LET b=q: GO TO 130
```

Lines 1110-1340 Update and print the score. Lines 1110-1140 deal with the shot absorption, lines 1210-1230 deal with any reflection of the laser shot, and lines 1300-1340 deal with the laser shot being deflected in the box.

Gemini for the 48K Spectrum

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C.0415 £24.95

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Having set up your fields, you may then add, delete or change information on the 'cards' under the headings you have elected. Gemini databases contain other important and useful utilities as well, e.g. alphabetical and numerical sorting, numeric calculations, finding records that meet specific requirements, line printer routines, browsing facilities, etc. For example a list of all recordings by a particular composer, calculate total value of freezer contents, etc.

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A full and useful range of routines is included in the menu, and the program allows you to set up your own format for printing labels, i.e. the tab settings you require and spaces between labels, etc. Multiple copies can also be printed.

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"Will enable business people with a moderate grasp of accounting principles to produce a set of figures that will satisfy both the bank manager and the Tax man."
— **Gemini Cash Book, Micro User, August 1983**

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```
1400 LET wr=0
1410 PRINT AT 21,2;"O.K. I'LL NOW CHECK POSIT
ONS"
1415 FOR f=1 TO 3: BEEP 0.5,0: NEXT f
1417 PRINT AT 21,0,,
1420 FOR f=1 TO np
1430 IF ATTR (y(f),x(f))<>48 THEN  LET wr=wr+
1
1440 NEXT f
```

Lines 1400-1440 Check the positions of the pegs.

```
1445 IF wr<>0 THEN  GO TO 1470
1450 PRINT AT 21,0;"ALL POSITIONS CORRECT WEL
L DONE"
1455 FOR f=0 TO 40 STEP 2: BEEP 0.01,f: BEEP
0.01,f+2: NEXT f
1460 GO TO 1520
```

Lines 1445-1460 Make sure all the pegs are in the correct positions once you've pressed the '1' key to say you have completed each round.

```
1470 PRINT AT 21,0; FLASH 1;wr;" WRONG . UNLU
CKY": BEEP 0.2,-10: BEEP 0.6,-30
1480 PRINT  FLASH 1;AT 1,1;"CORRECT";AT 2,0;"
POSITIONS"
1490 FOR f=7 TO 14: PRINT AT f,11;"aaaaaaa";
 NEXT f
1500 FOR f=1 TO np: PRINT AT y(f),x(f);"b": N
EXT f
1510 LET sc=sc+(wr*10)
```

Lines 1470-1510 If any pegs are in the wrong position, this routine indicates which pegs were positioned incorrectly and the place they should have been. Line 1510 increments the score.

```
1520 PRINT AT 21,0;"    YOU USED ";sc;" POINTS
 UP",: FOR f=1 TO 200: NEXT f: PRINT AT 21,2;
"       PRESS ANY KEY              "
1530 IF INKEY$="" THEN  GO TO 1530
1535 GO TO 80
```

Lines 1520-1535 Print the current score and return after a keypress for the next round.

```
2000 LET ts=ts+sc: LET sc=0
2010 LET r=r+1: IF r=6 THEN  LET r=5: GO TO 2
100
2020 PRINT  INK 3;AT 1,13;"THE";AT 2,11;"MYST
ERY";AT 3,13;"BOX"
2030 PRINT AT 5,0;"ROUND ";r;AT 8,0;"TOTAL";A
T 9,0;"SCORE ";ts;AT 12,0;"SCORE";AT 13,0;"TH
IS  ";sc;AT 14,0;"ROUND";AT 17,0;"No.";AT 18,
0;"PEGS ";np
2040 PRINT  INK 2;AT 18,12;"LOWEST";AT 19,9;"
SCORE SO FAR";AT 20,14;ls
2050 PRINT AT 3,23;"KEYS"
2060 FOR f=5 TO 20: PRINT AT f,21;"
 ": NEXT f: PRINT AT 5,22;"9 move";AT 6,27;"l
aser";AT 8,22;"0 fire";AT 9,27;"laser";AT 11,
22;"O place";AT 12,26;"a peg";AT 14,22;"1 pre
ss";AT 15,24;"when ";np;AT 16,24;"pegs in";AT
 17,24;"position"
2070 RETURN
```

Lines 2000-2070 Draw the main screen controls and score details. Lines 2010 checks to see if five rounds have been played.

```
2080 FOR f=5 TO 20: PRINT AT f,21;"
 ": NEXT f: PRINT AT 5,21;"move the ?";AT 6,2
1;"with the";AT 7,21;"cursor keys";AT 9,21;"p
 place peg";AT 11,21;"u remove """;AT 13,21;"
i skip"
2090 RETURN
```

Lines 2080-2090 Print details of how to position a peg on-screen.

```
2100 BEEP 0.1,0: BEEP 0.3,10
2110 PRINT AT 18,0;" FIVE ROUNDS ARE UP . SCO
RE ";ts
2120 IF ts<ls THEN  LET ls=ts: PAUSE 100: PRI
NT  FLASH 1;AT 21,0;"THAT IS THE LOWEST SCORE
 SO FAR ": FOR f=-10 TO 50 STEP 2: BEEP 0.05,
f: NEXT f
2130 PRINT AT 21,0;"PRESS ANY KEY FOR ANOTHER
 GO  "
2140 IF INKEY$="" THEN  GO TO 2140
```




```
2150 GO TO 60
```

Lines 2100-2150 Print the end of the game score. If you've scored the lowest score so far, your score will be printed up on-screen for you to view with pride.

```
2200 PRINT  INK 3;AT 1,14;"THE";AT 2,12;"MYST
ERY";AT 3,14;"BOX";AT 5,7;"By Peter J Simmons
"
2210 PRINT AT 7,0;"Shoot the laser into the b
ox and"'"from the way it behaves inside"'"ded
uce the positions of the "'"obstructing ~pegs
~ in as few "'"moves as possible"
2220 PRINT AT 13,0;"Your score for each of th
e five"'"rounds is equal to the number"'"of c
oded figures around the "'"box plus 10 times
the number"'"of pegs you get in the wrong"'"p
ositions"
2230 PRINT AT 21,0;"PRESS ANY KEY FOR NEXT PA
GE"
2240 IF INKEY$="" THEN  GO TO 2240
```

Lines 2200-2240 Print up the first page of on-screen instructions.

```
2250 CLS
2260 PRINT AT 1,2;"POSSIBLE PATHS OF LASER :"
2270 PRINT AT 3,2;"ABSORPTION   A eaaaab"
2280 PRINT AT 5,2;"DEFLECTION  the numbers ma
rk "'"the enty and exit points of the"'"defle
cted ray";AT 7,25;"b";AT 8,18;"2 eaaaa";AT 9,
24;"a";AT 10,24;"a";AT 12,24;"2"
2290 PRINT AT 14,2;"REFLECTION";AT 16,5;"R";A
T 18,5;"d";AT 19,5;"ab";AT 16,26;"b";AT 18,26
;"b";AT 17,19;"R eaaaa"
2300 PRINT AT 21,0;"PRESS ANY KEY FOR NEXT PA
GE": IF INKEY$="" THEN  GO TO 2300
```

Lines 2250-2300 Print up the second page of on-screen instructions.

```
2310 CLS : PRINT AT 2,1;"The rays path can in
clude more "'"than one of these patterns";AT
5,15;"b";AT 6,16;"aaaf R";AT 7,16;"a";AT 8,13
;"b  a";AT 9,14;"aaa";AT 10,13;"b   b"
```

```
2320 PRINT AT 21,0;"HOW MANY PEGS TO FIND (4
 OR 5)?": IF INKEY$<>"4" AND INKEY$<>"5" THEN
  GO TO 2320
2330 LET np=4: IF INKEY$="5" THEN  LET np=5
2340 BEEP 0.5,10: RETURN
```

Lines 2310-2340 Print up the third page of on-screen instructions. Line 2320 asks the player how many pegs are to be hidden in the box.

Here at *Your Spectrum*, we pride ourselves in providing you with the best in software each and every month. And how do we manage this amazing feat ... well, we don't — but *you do*!

A number of programs *are*submitted for publication from readers and, as you've no doubt gathered from past issues, the quality is pretty excellent. But that doesn't mean we don't want to hear from *you — Your Spectrum is your* magazine so make use of it. You're one of two million Spectrum users — don't just sit there, write us a program and be famous!

All we're looking for is a bit of originality, a sense of humour and some competent code. (Have a look at Gavin Monk's program in *YS* issue 10 if you're looking to nick some ideas to 'pretty up' your programs.) All we ask is that you don't type up a program from another magazine or book as we always find out in the end and your name will be mud throughout the industry.

(Remember the game, *Ground Attack* in *YS* issue 7? Well, the so-called author of that particular game (*We wouldn't want to mention his name because that would be indiscreet ... Anthony Crawford. Ed.*) stole it lock, stock and barrell from a weekly computer magazine; we didn't find out until after it had been published.)

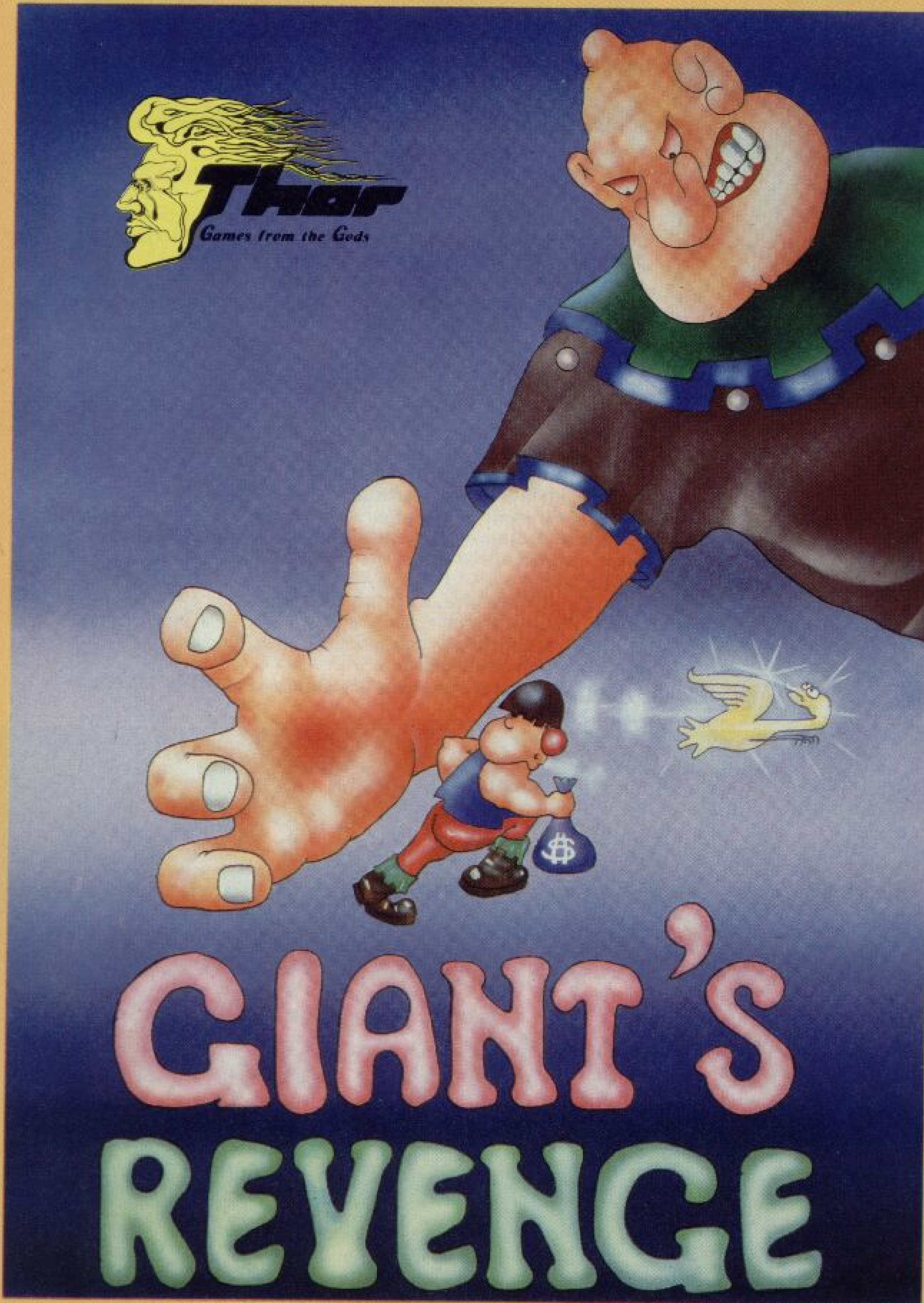
As further incentive, we do pay a sizeable sum for *good* programs. All we ask it that each program comes on cassette, with a written introduction and an annotated listing. Please send all programming contributuions to:

Gavin Monk, Your Spectrum, 14 Rathbone Place, London W1P 1DE.

HERE WE GO AGAIN

Sequel to No 1 Game Jack and The Beanstalk

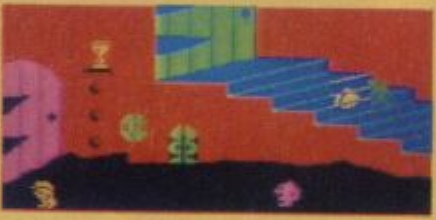
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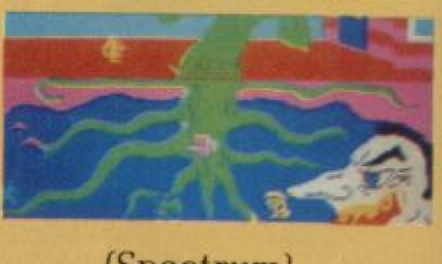


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■ 48K Spectrum, cassette recorder, Kempston joystick interface, over £150 worth of software including *Hunchback 2, Knightlore, Potty Pigeon* and more. Will sell for £220 ono. Tel. 01-639 2928 and ask for Antonio.

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■ 48K Spectrum for sale. Cassette recorder, Quickshot II joystick, Kempston Interface, various software including *HURG, Atic Atac, Lunar Jetman* and *Terrordaktil 4D*. £145 ono. Tel. Barnsley 763192 and ask for Jason Preston.

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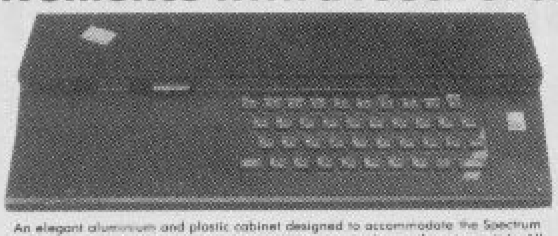
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■ Issue 3 of *YS*. Will pay £1.50 or swop for issue 8. Tel. Guidford 66248 (after 4.30pm) and ask for Matthew.
■ I need a 'trace' program for 48K Spectrum. Willing to pay £1 for best offer (also cost of tape and p&p). Send offers to David Rynell, 248 Greenmoor Road, Nuneaton, Warks CV10 7EP.
■ 48K Spectrum and cassette recorder, Kempston Pro Joystick Interface and joystick, 40 games to swop for CBM 64 & C2N and software if poss. Tel. 01-241 1936 and ask for Norman.
■ Good copy of *YS* issue 2, complete with *Ant Attack* poster. Tel. (09285) 69887 (after 4.15pm) and ask for Ady.
■ Currah MicroSpeech or ZX printer. Willing to swop for software including *Match Day, Combat Lynx, Match Point, Manic Miner, Lunar Jetman*. Tel. (0606) 45859 and ask for Andrew.
■ *YS* issues 2 and 3. Will swop for two recent original games. Tel. (0900) 65436 after 6pm and ask for David.
■ Microdrive and Interface 1 in working order. Will pay good price. Tel. 061-223 7857 and ask for Timothy.
■ *YS* issues 2, 3 and 7 wanted. Will gladly pay £1.50 per copy plus postage. Write to G Martin, 6 Stanley House, First Street, Harare, Zimbabwe.
■ Spare Spectrum software much appreciated for five-year physically handicapped boy. Educational material preferred. Please send to Nathan, 5 Nanpusker Road, Hayle, Cornwall.

MESSAGES

■ I have *YS* issue 3! What offers? Send SAE with your bids to Mark Gullen, 29 Woodland Park, Blackrock, Co Dublin, Eire.
■ Here's a message to anyone who can put *Ghostbusters, Daley's Decathlon, Knightlore, Cyclone, Jasper, Dark Star, Monty Mole*, etc. on to Microdrive — please tell me how! Tel. 01-699 7093 and ask for Richard.
■ Are we, 'Rare Frequency', the first pop/rock group to see a Spectrum on and off stage (connected through an effects box it sounds quite amazing!). This message is simply for publicity!

CLUBS & EVENTS

■ Der neugegründete Sinclair User Club Schweiz sucht Mitglieder (innen). Ebenso wünscht er Kontakt mit gleichgesinnten Clubs in Deutschland und Österreich. Tel. 01/241 19 08 oder 01/948 00 25.
■ National ZX Spectrum User Club. Bi-monthly newsletter contains hints and tips on Basic and machine code, plus all the latest news and reviews. Guy Fullalove, 'Woodcoates', Camer Park, Meopham, Kent.
■ Softare exchange club seeks new members. Swop your used programs. Free membership. Spectrum/Dragon periodic discount offers. Join the biggest and best! SAE for details, UKSEC (*YS*), 15 Tunwell Greave, Sheffield S5 9GB.

PEN PALS

■ Pen pal wanted, 13+. I like games playing, music and animals. Neil Short, 10 Masterman Place, Middleton-in-Teesdale, Barnard Castle, Co Durham DL12 0ST.
■ I've just started playing *The Hobbit* and would like a pen pal to play with. Ian Smith, 8 Hockley Road, Bramford Estate, Cosley, West Midlands WU14 9TT.
■ Pen pal wanted to swop software and hacker hints. Under 12s please. Tel. (0353) 777412 and ask for Ben John.
■ Male computer nut wishes to meet female computer nut age 18 for friendly relationship. Photo essential, London area. Tel. 01-241 1936 and ask for Norman Tierney.
■ Pen pal wanted to swop tapes, etc. I'm 14 and like golf, badminton, video games, punk music and arcade computer software. Graham Grant, 43 Westbrae Cresent, Turriff, Aberdeenshire, Scotland.
■ I have the American equivalent of the Spectrum. American software is useless. Would anyone be interested in swopping games trans-Atlantic? Situation desperate. Nik Carle, 5 Lakewind Road, New Canaan, Connecticut 06840, USA.
■ Female pen pal in the London area wanted for 14-year old who enjoys hacking (software and people). Intelligent, witty, nice and very modest. Paul O'Connell, 58 The Mall, Kenton, Harrow, Middx HA3 8TD.
■ Pen pal wanted. My name is Tim Wreford, I'm 14 and I would like someone male or female to share programming tips, POKEs, games, etc. Tim Wreford, 74 Duke Street, Windsor, Berkshire.
■ 13-year old pen pal wanted. Tel. Ashwater 21394 and ask for Mark.
■ Bored Speccy Microdriver with small knowledge of machine code and megabytes of games seeks preferably female sufferer in similar condition. Tel. 01-699 7093 and ask for Richard.
■ Pen pal wanted to swop tapes, hints and tips on adventures, etc. Jeff Rogers, 26 Harry Price House, Hartlebury Road, Oldbury, Warley B69 1EQ.
■ Pen pal wanted. I've just got a 48K Spectrum and would like to hear from anyone who would like to help me to program, etc. You must be female and about 17. Anita Taylor, 19 St Stephens Drive, Aston, Sheffield, South Yorks S31 0EP.
■ Pen pal wanted for exchange of ideas, communication and swopping programs. More than 300 programs. Nick Denikarias, Christopoulou 64, GR 18757 Keratsini, Greece.
■ Pen pal wanted. 15 years old, Spectrum owner, Into LOM, hacking, Sc-Fi, Jarre, peace. Gavin McEwan, 33 Clifford Road, North Berwick, East Lothian, Scotland EH39 4PP.
■ Wanted, female pen pal to share hints, tips, etc. I own a 48K Spectrum and like most games. James Gogarty, 36 Beverley Road, Stevenage, Herts. I am 15.
■ I'm Andrew. I desperately want a female penfriend for exchanging hints on games. Also on inter-relation controls of 12/13-year olds. You *must* like Spectrums. Tel. Tadley 6582 and ask for Andrew Rollings.



CIRCE

Out on the fringes of the computer world, there are all sorts of people producing peripherals that* Sir Clive *never bothered about.* Kevin Cox *sparred with* David Heelas *of Dk'Tronics at the recent ZX Microfair — this is his blow-by-blow account ...



MINDING HIS OWN BUSINESS

You don't have to be in the company of David Heelas for too long before it becomes clear why *he* had the idea for a Spectrum game called *Minder*. He and Terry McCann have a lot in common. They've both been around a while and seen a thing or two ... and neither pulls his punches!

Beginning my interview in a rather inauspicious way, I asked him what he was doing before Dk'Tronics? "I can't remember!," he replied. Fortunately, his convenient attack of amnesia passed and he soon became forthcoming about his time in the 'biz'.

"I started four years ago just prior to the launch of the ZX81. Our first product was a 16K expansion pack for the ZX80. It was just me, then part-time, and I got interested because of my interest in electronics. The stupid thing was that I could see the market growing but not to the extent it has; although the ZX81 created the interest, it took the Spectrum to take it the distance.

"I went full-time with the launch of the ZX81. The business was all mail-order then, but I was getting a very good response. I had to do everything myself — manufacturing, packaging, selling and posting — and I was working in my bedroom, my garage, my shed (*Shades of Arthur Daley's lock-up! Ed.*) — anywhere there was room! But by the end of '81, I had four employees, a range of products including a keyboard for the ZX81 and new premises!"

What was your reaction to the Speccy? You must have blessed Sir Clive for that rubber keyboard!

"As soon as we got hold of the Spectrum, we re-vamped the ZX81 keyboard and brought out a version for the Spectrum at £45. Frankly, I didn't really think people would pay it, but it just shows you how wrong you can be. We've sold 80 to 90,000 of them to date. Fuller was doing the same thing but approaching it all wrong — the product was OK, but the customer service was appalling."

No punches pulled here!

Tell us about the recent take-over of Currah. Did you have your eye on the company?

"No, we had no intentions of buying Currah whatsoever! But circumstances change and now it's done, it seems that taking the company over is a logical extension of our product range. We'd thought of doing a speech synthesiser but Currah had the market sewn up. Apparently, there was an article about Dk in the computer press last November which prompted someone quite high up in Currah to phone me for a job. Something was obviously up, so I began talks with the company's chairman. Next minute, the receiver's called in and we're offered the whole company!"

So, how much did Currah set you back?

"Let's just say it was an undisclosed but substantial five-figure sum." (*Whatever happened to 'No comment'? Ed.*)

Do you intend to keep adding more and more to the Speccy or have you exhausted its possibilities?

"We're certainly not going to desert the Spectrum, but we shall be broadening our base on to other micros. For the Spectrum we're releasing µSource, an Assembler/Forth 'on-board' ROM — another product we nabbed from Currah.

"Of course, what we really need is a product in our own right. We're going for micro-processor based consumer products — the first is due this year. I can't tell you exactly what it is but it will be connected with music and will have a screen and a music keyboard, all for about £100.

"It's come about from some work we're doing for Memotech. We're designing a music peripheral for Memotech to co-incide with its big sales push behind the Iron Curtain. I shall probably be going to Russia later this year, and from that project will come a similiar peripheral for the Speccy with a half-size music keyboard for about £30.

"We've also got a slant on a new idea in connection with British Telecom. The short and curlies of the matter is that we're going for a US/M listing in 1986 and we need to strengthen our base. The shine has definitely gone out of the computer market."

Have you completely abandoned software?

"We made a lot out of software, especially in the period between 1982-83. But we decided that it was too much of a rat-race. When we started, a game lasted six months, but now you're lucky if it's around for six weeks! There must be around 300 companies chasing an ever diminishing market, and that's without considering piracy. Too much hassle all round! Still, we're releasing *Popeye* — it could have been out now if the programmer hadn't done a runner on us — and, of course, there's *Minder*." David Heelas supped the last of his pint. "And that's not an easy subject to capture."

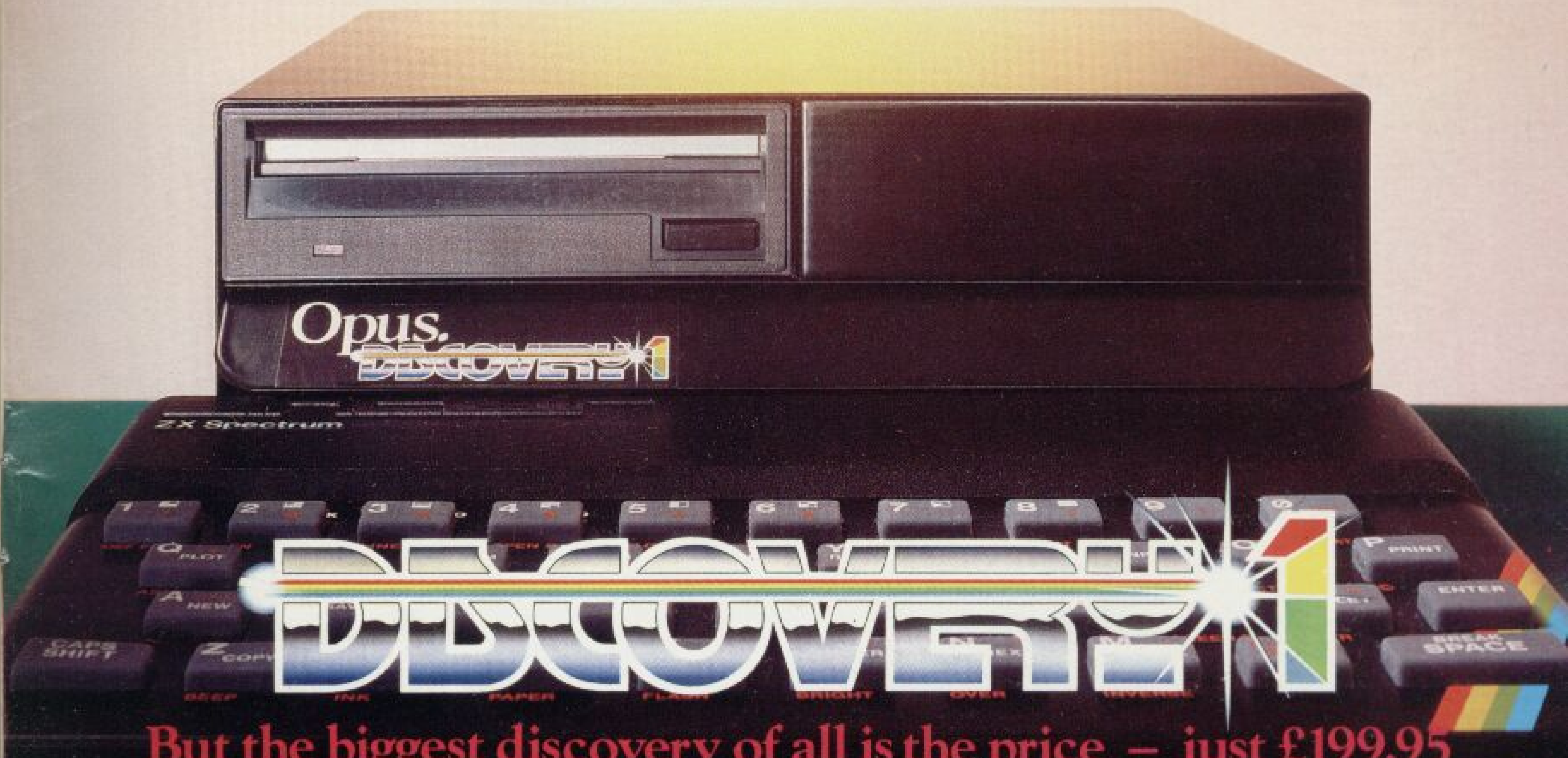
Editor Roger Munford; **Art Editor** Hazel Bennington; **Deputy Editor** Peter Shaw; **Production Editor** Louise Cook; **Art Assistant** Martin Dixon; **Editorial Consultant** Andrew Pennell; **Software Consultant** Gavin Monk; **Contributors** John Torofex, Stephen Adams, Roger Willis, Dave Nicholls, Ross Holman, Kevin Cox, AM Grant, Colin Barnsley, PJ Simmons, Chris Wood, Clive Gifford, Toni Baker, Craig Rawstron, Sue Denham, Mike Leaman, AJ Unwin; **Advertisement Manager** Joe Harrower; **Advertisement Executive** David Baskerville; **Production Manager** Sonia Hunt; **Group Advertisement Manager** Jill Harris; **Group Art Director** Perry Neville; **Publisher** Stephen England; **Published by** Sportscene Specialist Press Ltd, 14 Rathbone Place, London W1P 1DE. **Telephone (all departments)** 01-631 1433. **Telex** 8954139 BunchG. Company registered in England; **Typesetters** Carlinpoint, London; **Reproduction** Graphic Ideas, London; **Printed by** Chase Web Offset, St Austell, Cornwall; **Distribution** Seymour Press, 334 Brixton Road, London SW9. Telephone 01-733 4444. *Your Spectrum* is a monthly publication.

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